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# A Legacy of Land Treatments

Final Report of the 2002 BLM Legacy Program



Bureau of Land Management  
National Science and Technology Center  
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## Table of Contents

Executive Summary .....	3
Introduction .....	4
Sites Visited During Legacy 2002.....	6
Eastern Oregon.....	6
Southcentral Idaho.....	7
Western Colorado.....	7
Central Wyoming.....	7
Land Treatments in the Arid West—Lessons Learned .....	8
Monitoring, Data Management and Reference Areas .....	10
The Importance of Long-term Monitoring .....	10
Recordkeeping and Data Management.....	10
Reference Areas .....	11
Opportunities for Volunteers.....	11
Conclusions and Recommendations.....	13
Literature Cited .....	15
Appendix A – Guidance for Site Visits.....	16
Guiding Questions for the Legacy Program, FY 2002.....	16
Recommended Outline for Site-specific Reports .....	16
Appendix B - List of Participants, FY 2002.....	18
Legacy Participants (Retirees & Active Employees) .....	18
Participating Field Offices.....	18
Appendix C - Site-specific Reports.....	19
Vale Project (Authors: Bob Kindschy, Al Logosz, Chad McBurney, Roger Mertens, Ed Spang) .....	C1
Jarbidge Field Office (Author: Gary Blincow).....	C20
Uncompahgre Plateau (Authors: George Hollis and Dave Wickstrom).....	C30
Blue Mesa (Author: Dave Wickstrom).....	C40
Lander (Author: James “Smokey” O’Conner).....	C46
Worland (Author: James “Smokey” O’Conner).....	C50

### Cover Photo

Burt Silcock, BLM Director (1971-1973), and contour furrows in the 15-mile Watershed near Worland, Wyoming. Photograph taken circa 1957.



## Executive Summary

The BLM Legacy Program was created to provide current BLM field managers and specialists with an opportunity to learn about past land management practices and land treatments and evaluate the results of those practices 25 or more years later. In many cases, those land treatments resulted in the landscape conditions that we see today throughout the West. Many of the professionals who were involved in those activities have since retired or are nearing retirement. The Legacy Program is intended to bring together current land managers and specialists with those retired and still active employees who performed the land treatments in the past. Many of the professionals who were involved in those activities have since retired or are nearing retirement. The underlying philosophy is: if we don't learn from the past, we are bound to repeat our mistakes in the future.

The focus for 2002 was on vegetation treatments such as sagebrush control, pinon-juniper chaining, grass reseeding, and prescribed fire. The goal was to evaluate these past land treatments in several representative areas: eastern Oregon, southcentral Idaho, western Colorado, and central Wyoming. For each location, we matched volunteer retirees and/or senior BLM employees with cooperating BLM field offices. The field visits were not formal evaluations. We simply wanted to observe these older projects and learn from them and from the people who worked on them. The teams did not have the time, nor was it our objective, to do an in-depth scientific analysis of the land treatments. The door was left open for field offices to follow-up with more in-depth evaluations or monitoring of the project results and site conditions. All the land treatments visited in 2002, whether deemed successes or failures, have value in that they provide opportunities for learning how different plant communities respond to various land treatments and how those responses are influenced by post-project management and by wildfire.

Land treatments are investments that need to be tracked, evaluated, and maintained throughout their effective lives. Proper management of treated areas, including use monitoring and use adjustments, is a critical aspect of protecting those investments. Vegetation manipulations in sagebrush steppe and pinon-juniper often require re-treatment in 15 to 20 years. A better understanding of site potential and plant community dynamics, coupled with new technology (GPS, GIS) and wider variety of treatment options (mechanical, chemical, prescribed fire), provides enhanced opportunities for re-treating those areas.

The 2002 Legacy field visits pointed out the need for a Bureau-wide commitment to long-term ecological monitoring and proper data management. We believe that volunteers, especially retirees, could be used effectively for monitoring and data management activities.

The Public Lands Foundation (PLF) was a valuable partner in the 2002 Legacy effort. PLF could play a larger role in the future, in terms of co-organizing Legacy activities, making PLF members aware of volunteer opportunities, and brokering volunteer opportunities for PLF members on a state-by-state basis.



## Introduction

The BLM Legacy Program was created to provide current BLM field managers and specialists with an opportunity to learn about past land management practices and land treatments and evaluate the results of those practices 25 or more years later. The Program is intended to bring together current land managers and specialists with those retired and active employees who performed the land treatments in the past. The underlying philosophy is: if we don't learn from the past, we are bound to repeat our mistakes in the future. In that sense, the past can contribute knowledge to the future.

The BLM has been authorizing uses, conducting studies, performing land treatments and vegetation manipulations, and implementing various other practices on its lands for the past 55 years. Many of these activities were state-of-the-knowledge when they were performed. They resulted in the landscape conditions that we see today throughout the West. Many of the professionals who were involved in those activities have since retired or are nearing retirement. The Bureau has an opportunity to learn much from those activities that occurred over the years. In particular, we have the opportunity to assess and determine the successes or failures of various land treatments and practices over time and to apply this knowledge to current management activities.

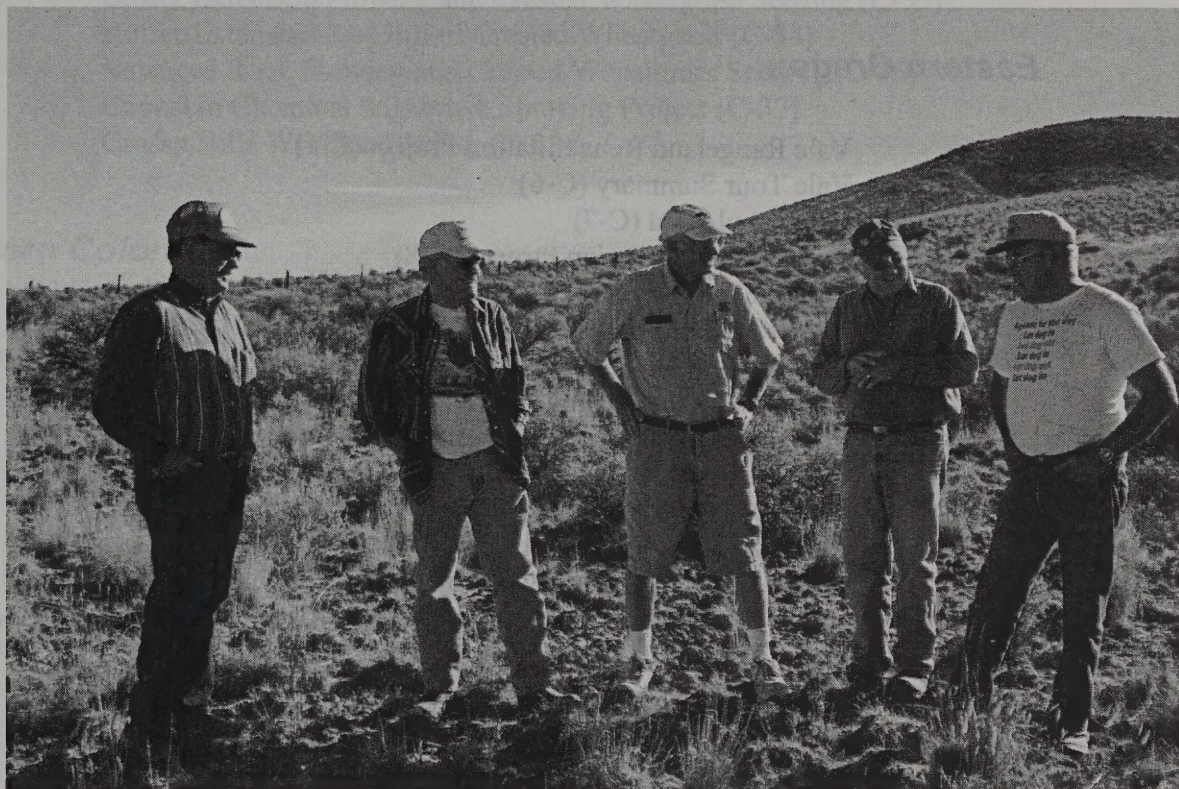
The focus for 2002 was on vegetation treatments such as sagebrush control, pinõn-juniper chaining, rangeland reseeding, and prescribed fire. The goal was to evaluate these past land treatments in several representative areas. Four areas were selected: eastern Oregon, southern Idaho, western Colorado, and central Wyoming. Cooperating field offices included the Jordan Resource Area, Vale District, Jarbidge Resource Area in the Boise District, Grand Junction Field Office, Montrose Field Office, Lander Field Office, and Worland Field Office. For each location, retirees and/or senior BLM employees were matched with cooperating field offices. Each team was asked to address a set of standard questions (Appendix A) for the land treatments visited. An introductory meeting of the volunteers and cooperating field office personnel was held at each location prior to the field tour. Following the field tour, a close-out meeting was held to discuss observations, conclusions, and recommendations.

The field visits were not formal evaluations. The goal was to observe these older projects and learn from them and from the people who worked on them. The teams did not have the time, nor was it our objective, to do an in-depth scientific analysis of the land treatments. The door was left open for field offices to follow-up with more in-depth evaluations or monitoring of the project results and site conditions.

Most of the land treatments discussed in this report were implemented prior to 1970, predating both FLPMA and NEPA, and thus were responding to the land management paradigm of that period. The management objectives at that time were more narrowly focused on increasing forage for livestock. Under the old paradigm, sagebrush was something to be eradicated and pinõn-juniper trees were to be replaced with grass. Concerns over wildlife habitat, visual impacts, and biodiversity have changed the way we think about sagebrush steppe and pinõn-juniper plant communities. Our current observations and



conclusions about past land treatments are influenced by these changing resource management paradigms.





## Sites Visited During Legacy 2002

The project sites visited during the summer of 2002 are listed below. Site-specific reports, prepared by the Legacy 2002 participants, are included in their entirety in Appendix C. The reader is encouraged to read the individual reports for detailed information on individual sites.

### **Eastern Oregon**

Vale Rangeland Rehabilitation Project (C-1)  
 Vale Tour Summary (C-6)  
 Lytle Boulevard (C-7)  
 Succor Creek Riparian Project (C-8)  
 Spring Creek Seeding (C-8)  
 Big Ridge Seeding (C-8)  
 Shellrock Brush Control (C-8)  
 Schnable Creek Seeding (C-8)  
 Mud Creek Well and Northwestern Cow Creek (C-8)  
 Owyhee Butte Seeding (C-8)  
 CCC Exclosure (C-8)  
 Antelope Seeding (C-8)  
 Cantor Corral Noodle-Bowl Project (C-9)  
 Gluch Pit Seeding and Exclosure (C-9)  
 Rock Creek Reservoir Project (C-9)  
 Jackies Butte Seeding (C-9)  
 Battle Creek Seeding (C-9 and C-10)  
 Vale Project Interpretative Site (C-10)  
 Greely Seeding (C-10)  
 Rome Seeding (C-10)  
 Overshoe Seeding (C-10)  
 Rattlesnake Reservoir Project (C-10)  
 Echave Reservoir Project (C-10)  
 Antelope Creek Project (C-11)  
 Highway 95 Fire Rehabilitation Seedings (C-11)  
 Bankofier Spray and Seed Project (C-11)  
 Bretz Seeding (C-11)  
 Disaster Peak Seeding (C-11)  
 Whitehorse Seeding (C-11)  
 Little Whitehorse Creek Exclosure (C-11)  
 Willow Creek Project (C-12)  
 Hooker Creek Seeding (C-12)  
 Big Ridge Seeding (C-12)



### **Southcentral Idaho**

Upper Pothole Plowing and Crested Wheatgrass Seeding (C-29)  
Three Tip Plowing and Crested Wheatgrass Seeding (C-31)  
Buffer Extension Plowing and Crested Wheatgrass Seeding (C-33)  
Buffer Extension Re-Drill of Crested Wheatgrass (C-34)  
Balanced Rock Plowing and Crested Wheatgrass Seeding (C-36)  
Coonskin Chemical Sagebrush Spraying Project (C-37)  
Grassy Hills Wildfire Seeding (C-39)

### **Western Colorado**

Uncompahgre Plateau Pinõn-juniper Chainings (C-40 to C-49)  
    Simms Mesa  
    Paxton  
    Highway 90  
    Log Hill Mesa  
Blue Mesa Timber Sales and Reforestation Project (C-50)

### **Central Wyoming**

Lander--Granite Mountain Sagebrush Spraying Project (C-55)  
Worland--Burnt Wagon Contour Furrowing (C-58)  
Worland--15-Mile Waterspreader Dikes and Contour Furrowing (C-58)



## Land Treatments in the Arid West—Lessons Learned

Several common threads ran through the 2002 Legacy site visits. The most obvious lesson learned is that management objectives have changed considerably during the past 30 to 40 years. In the 1950s and 1960s, management goals for sagebrush steppe and pinõn-juniper vegetation types focused on increasing forage availability for livestock, halting soil erosion, increasing soil moisture, and stabilizing the local livestock industry. Those objectives led to treating very large areas essentially the same. Today, management goals are different and perhaps more complex. They include greater vegetation diversity, reestablishment of native species, and wildlife habitat improvement. Management objectives are likely to become even more complex in the future.

Each and every land treatment, regardless of outcome, was successful because we can glean valuable information from them if we take an objective, unbiased approach. In essence, every land treatment project represents a story worth documenting. For example, the Vale Project is unique in BLM because it offers many opportunities to learn from vegetation manipulations on different sites subjected to different post-treatment management. The Vale Project was a pilot program and was to serve as an example for similar management actions on BLM-managed public lands in other locations around the West.

Some of the retirees noted that they lacked a complete understanding of sagebrush physiology and plant community dynamics when the sagebrush plowing and grass reseeding projects were planned and implemented. They lacked knowledge about how sagebrush-grass plant communities would respond to treatment over the long term and how long it would take for sagebrush to reinvade. Similarly, one retiree remarked that little was known about site potential, especially soils information, when he was involved in pinõn-juniper chaining. The present availability of better information on site potential and vegetation dynamics coupled with new equipment such as GPS, roller choppers, Hydro-axe, Lawson Renovator, etc., make it possible now to better design treatments that produce mosaic-type vegetation patterns and diverse habitats in pinõn-juniper plant communities. In the case of sagebrush steppe, large areas often were treated uniformly, leaving a very homogenous landscape. With more knowledge of site potential and more tools for manipulating sagebrush, vegetation treatments today can result in mosaic-type patterns and more diverse habitat in sagebrush steppe plant communities.

Land treatments are investments with finite lives and the BLM has the responsibility to protect those investments. To maximize the return from those investments, treated areas require periodic inspections, use monitoring, evaluations, maintenance, and proper post-project management. Sagebrush has reinvaded many of the treated areas. Re-treatment of sagebrush steppe (prescribed fire, mechanical or chemical control) or pinõn-juniper stands (mechanical thinning or prescribed fire) may be necessary after 15 to 20 years to regain desired results. In southcentral Idaho (Jarbidge Resource Area), wildfire or prescribed fire was an effective re-treatment in sagebrush steppe some 20 years following sagebrush plowing and grass reseeding.



Post-project evaluations are important learning tools and should be conducted periodically following all land treatments. Evaluations of the Vale Project were done by university scientists (Heady and Bartolome, 1977; Heady, 1988), thus providing an independent, unbiased view of those land treatments. It was the consensus of the Legacy team that initial evaluations of land treatments should be done within five years following project completion and every 10 years thereafter. Since the Vale Project was last evaluated in 1988, another evaluation should be completed in FY03 or FY04.

Most field offices had kept and maintained their project records. However, in a few cases records had been lost. Proper data management is an important facet of the land treatment legacy and its importance cannot be overemphasized. Record files should include original project documentation on the planning and implementation phases, monitoring data and interpretations, inspection and evaluation results, and photographs.

There was no consistent approach to monitoring of the land treatments that were visited. Monitoring of project results, use monitoring, and long-term monitoring of ecological conditions must be a Bureau-wide commitment. We address this topic in more detail in the following section. One of the most important lessons learned in the Legacy 2000 site visits was the significance and value of project documentation and record maintenance, including project description and objectives, baseline or reference area documentation, follow-up monitoring, data analysis and application of results. This is not a new or surprising finding, but important enough to deserve a separate section in this report.





## Monitoring, Data Management and Reference Areas

### ***The Importance of Long-term Monitoring***

A common thread that ran throughout many of the sites we visited was the ubiquitous problem of the lack of monitoring data. In many cases project monitoring was not done, or it was done sporadically without consistent documentation, or monitoring was done but the records had been lost or destroyed. This is not a criticism of any single field office, but a universally-recognized shortcoming that needs resolution Bureau-wide.

It is worth noting that Bob Kindschy, wildlife biologist retired from the Vale District, was recognized in the 1988 evaluation of the Vale Project for his "foresight in establishing permanent plots to monitor change in vegetation, wildlife species populations, and riparian conditions" (Heady, 1988). Kindschy's periodic sampling of those plots provided Dr. Heady's evaluation team a more than 25-year-record of post-treatment conditions in the Vale Project area. Kindschy has continued to re-sample those plots on a voluntary basis, providing the Vale District with an extremely valuable long-term data set.

Monitoring must have well-defined objectives. Ed Spang reminded us that monitoring must be consistent, timely, and useable. Both managers and resource specialists must recognize the value of long-term, uninterrupted monitoring and make a firm commitment to funding and implementing appropriate monitoring activities.

We were particularly impressed with the Montrose Field Office's "model" for monitoring. Montrose employs a full-time ecologist responsible for monitoring. The position is shared by several resource programs and funded by several subactivities. The Montrose model should be considered by BLM for implementation in other field offices, and perhaps also in the Washington Office.

### ***Recordkeeping and Data Management***

Good documentation, recordkeeping, and data management should accompany monitoring. Permanent sites used for monitoring, such as exclosures, transects, plots, and photo points, should be marked with GPS-located aluminum project markers and entered into the Rangeland Improvements Project System (RIPS) database. The availability of modern technology (GPS, GIS, digital photography, and computer-based data storage media) provides the BLM the opportunity to more effectively and efficiently accomplish project documentation and record management. The BLM may never recover the valuable data that has been lost or destroyed. BLM will probably not be able to digitize the available analog data that exists in hard copy files. A deliberate effort should be made to implement data management guidelines and requirements to capture and properly archive new monitoring data. This is particularly important and necessary in today's times with the increasing



emphasis by BLM management and the public on the application of good science in making BLM resource management decisions.

## ***Reference Areas***

BLM Handbook H-4180-1 (Rangeland Health Standards) defines ecological reference areas as landscape units in which ecological processes are functioning within a normal range of variability and the plant community has adequate resistance to and resiliency from most disturbances. Based on that definition, ecological reference areas may be selected to represent the ecological potential of a landscape unit in terms of ecosystem structure and function and biological health.

Exclosures represent one type of reference area. The 1977 evaluation of the Vale Project pointed out that many (approx. 70) exclosures were built in the Vale District for studies, plot monitoring, protection of riparian vegetation and wildlife habitat, and protection of reservoirs (Heady and Bartolome, 1977). Exclosures are important sources of "benchmark" information for evaluating adjacent treated and managed rangelands. If exclosures are to be used as reference areas, they must be maintained.

Untreated, unfenced areas in desired plant communities could also be used as reference areas for ecosystem restoration or vegetation manipulation projects. One example would be research natural areas. Laycock (1975) pointed out that rangeland reference areas might also include fairly large areas in good ecological condition, set aside or managed carefully to preserve or maintain that condition. Under that scenario, the reference areas could serve as comparison or control sites for land treatments or restoration projects.

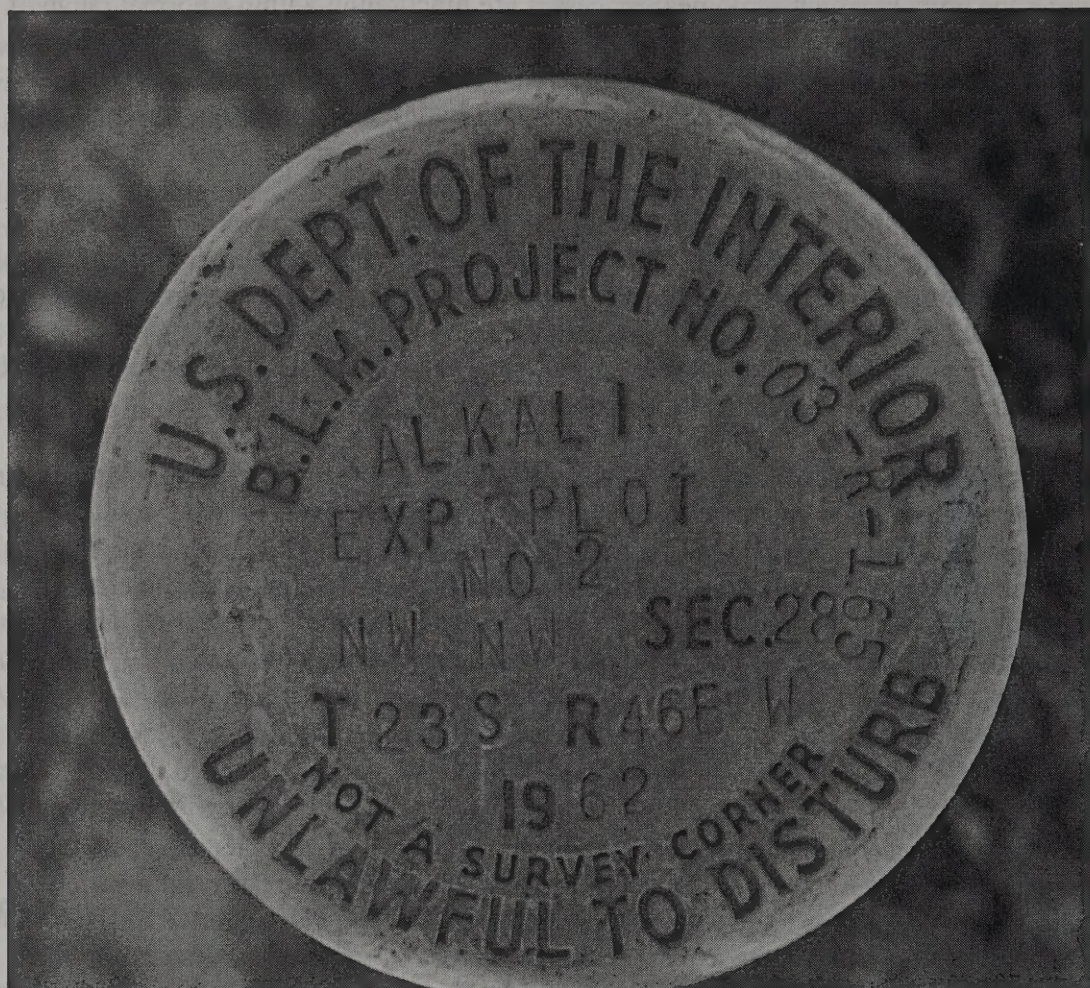
## ***Opportunities for Volunteers***

Several of the Legacy volunteers remarked that field office staff 30 years ago spent the majority of their time in the field and very little time in the office. Today, for a variety of reasons, the reverse seems to be true. The Legacy 2002 field visits suggested the opportunity for BLM field offices to use the experience and expertise of retirees as a resource to accomplish monitoring activities that could not otherwise be accomplished by a limited field office workforce. We identified several field-oriented opportunities for volunteers. Under the broad topic of monitoring, volunteers could assist field offices in monitoring, including the sampling of plots and transects, installing project markers at plots, transects, and exclosures, replacing signs, updating and maintaining records on past land treatments, retaking photo points, and collecting location information for permanent plots, transects, and exclosures for input to the RIPS database.



# The Importance of Long-term Monitoring

Reference Area





## Conclusions and Recommendations

The Legacy Program is about connecting people and learning from the past. It connects retirees and senior BLM employees with the field offices where they worked earlier in their careers. It connects retirees with each other and it connects "old hands" with "new hands." As a pilot effort during August, 2002, we linked 12 Legacy volunteers (10 retirees and 2 senior employees) with six field offices. We visited 49 land treatment sites in four states, focusing on the sagebrush steppe and pinõn-juniper vegetation types. The objective was to see what we could learn from these past land treatments.

All the land treatments visited in 2002, whether deemed successes or failures, had value in that they provided opportunities for learning how different plant communities responded to various land treatments and how those responses were influenced by post-project management and by wildfire. Land treatments are investments that need to be tracked, evaluated, and maintained throughout their effective lives. Proper management of treated areas, including use monitoring and use adjustments, is a critical aspect of protecting those investments. Vegetation manipulations in sagebrush steppe and pinõn-juniper often require re-treatment in 15 to 20 years. A better understanding of site potential and plant community dynamics, coupled with new technology (GPS, GIS) and wider variety of treatment options (mechanical, chemical, prescribed fire), provides enhanced opportunities for re-treating those areas.

The 2002 Legacy field visits pointed out the need for a Bureau-wide commitment to long-term ecological monitoring and proper data management. Reference areas, including both exclosures and unfenced areas, should be established at the initiation of a management treatment. They should be GPS-located, monumented, properly maintained, and consistently checked. Permanent transects and plots used for monitoring should be GPS-located, monumented, and entered into the RIPS database. Project records should include an inventory of exclosures, monitoring plots and transects, and should be properly maintained and archived. We believe that volunteers, especially retirees, could be used effectively for monitoring and data management activities.

The Public Lands Foundation (PLF) was instrumental in distributing Legacy Program information throughout their membership. We suggest that PLF could play a larger role in co-organizing Legacy activities, making PLF members aware of volunteer opportunities, and brokering volunteer opportunities for PLF members on a state-by-state basis.

Legacy 2002 was highly successful and we recommend the Legacy Program be continued and evaluated at the end of FY03. An immediate benefit of implementing the pilot effort in 2002 was planting the seed for state offices and field offices to sponsor their own legacy programs in the future. To increase the effectiveness of the Legacy Program in FY2003 we recommend that earlier notification and requests for site nominations be made to the field offices and additional time be provided to the retirees for preparation for visits to the respective field offices.





The Legacy 2002 was highly successful and was announced the Legacy 2002 program to be continued and evaluated at the end of FY02. An immediate benefit of implementing the pilot effort in 2002 was placing the seed for state officers and field officers to sponsor their own Legacy programs in the future. To increase the effectiveness of the Legacy Program in FY 2003 we recognized that earlier notification and requests for the nominations be made to the field officers and advisors that be provided to the members for preparation for value in the respective field offices.

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## Literature Cited

Heady, Harold F. and Bartolome, James. 1977. The Vale Rangeland Rehabilitation Program: The Desert Repaired in Southeastern Oregon. USDA Forest Service Resource Bulletin PNW-RB-70. Portland, Oregon: U. S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 139p.

Heady, Harold F. 1988. The Vale Rangeland Rehabilitation Program: An Evaluation. USDA Forest Service Resource Bulletin PNW-RB-157. Portland, OR: U. S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 151p.

Laycock, William A. 1975. Rangeland reference areas. Range Science Series #3. Denver, CO: Society for Range Management. 66p.

U. S. Bureau of Land Management. 2001. BLM Handbook H-4180-1 - Rangeland Health Standards. Release 4-107, January 19, 2001. Washington DC: U. S. Department of the Interior, Bureau of Land Management. 39p.





## Appendix A – Guidance for Site Visits

### ***Guiding Questions for the Legacy Program, FY 2002***

The following questions were used to guide the field visits and the preparation of the various site reports. Using the same questions for all site visits allowed us to look at regional trends and conclusions.

We asked participants to address Questions 1 thru 6 prior to the field visit. Questions 7 & 8 were addressed during the close-out of each site visit.

1. What were the project objectives?
2. What were the goals or expectations in terms of future resource values or uses?
2. When was the project implemented?
3. What vegetation treatments were done? (R<sub>x</sub> fire, mechanical, chemical, etc.)  
Treatment/application methods used? (aerial spray, ground spray, chaining, tilling, etc.)
4. Was monitoring included in the project? If so, what type of monitoring was conducted (transects, photo points, plots)?
5. If photo points were established, have they been re-taken recently?
6. What post-project management was planned or used? (e.g.--summer grazing, winter grazing, rest rotation grazing, rest, follow-up treatments like prescribed burning, etc).
7. What are your observations and conclusions based on the 2002 site visit?
8. What do you recommend in terms of follow-up actions?

### ***Recommended Outline for Site-specific Reports***

- I. Project Description
  - a. Name of Project or Area
  - b. Location (field office, allotment, watershed)
- II. Project Objectives (what were the stated project objectives?)
  - a. Management Goals (in terms of longer-term expectations)
  - b. Resource values
- III. Vegetation changes
- IV. Pre-project baseline data and/or monitoring



- a. Transects or plots
- b. Photo points
- c. Type and location of documentation
- V. Implementation
  - a. Implementation dates (when implemented?)
  - b. Describe treatments
- VI. Post-project land management
  - a. Fencing, water developments
  - b. Grazing system (stocking rates, season of use, initial rest)
  - c. Follow-up treatments (e.g. prescribed fire)
- VII. Post-project monitoring
  - a. Transects or plots
  - b. Photo points
  - c. Type and location of documentation
  - d. Cross-walk the information to planning and implementation
- VIII. Results
  - a. Observations and conclusions
  - b. Were objectives met in terms of project objectives?
  - c. Were expectations met in terms of longer term goals and expectations?
  - d. Other conclusions (vegetation composition, cover, wildlife habitat, overall land health)
  - e. What would you do differently today
  - f. What are the lessons learned that could be applied in this area in the future?
- IX. Recommendations
  - a. What recommendations do you have for the current field manager?
  - b. Follow-up treatments?
  - c. New treatments needed?
  - d. Management?
  - e. Monitoring? (use supervision and long-term monitoring)



## Appendix B - List of Participants, FY 2002

### ***Legacy Participants (Retirees & Active Employees)***

Gary Blincow (Worland FO)  
 George Hollis (WO-220)  
 Gus Juarez (R)  
 Bob Kindschy (R)  
 Bob Kline (R)  
 Al Logosz (R)  
 Chad McBurney (R)  
 Roger Mertens (WYSO)  
 Smokey O'Connor (R)  
 Al Piersen (R)  
 Ed Spang (R)  
 Bruce Van Haveren (NSTC)  
 Bill Wagner (R)  
 Dave Wickstrom (R)

### ***Participating Field Offices***

Jordan Resource Area, Vale District, Oregon  
 Jarbidge Resource Area, Boise District, Idaho  
 Grand Junction Field Office, Colorado  
 Montrose Field Office, Colorado  
 Lander Field Office, Wyoming  
 Worland Field Office, Wyoming

### ***Recommended Outline for Site-specific Reports***

- I. Project Description
  - a. Name of Project or Area
  - b. Location (Field office, District, State)
- II. Project Objectives
  - a. Major Goals (in terms of longer term objectives)
  - b. Resource values
- III. Vegetation changes
- IV. The project baseline data and monitoring



## Appendix C - Site-specific Reports

**Vale Project (Authors: Bob Kindschy, Al Logosz, Chad McBurney, Roger Mertens, Ed Spang), pages C1-C11**

**Jarbidge Field Office (Author: Gary Blincow) pages C12-C22**

**Uncompahgre Plateau (Authors: George Hollis and Dave Wickstrom) pages C23-C31**

**Blue Mesa (Dave Wickstrom) pages C32-C36**

**Lander (Author: James "Smokey" O'Conner) pages C37-C38**

**Worland (Author: James "Smokey" O'Conner) pages C39-C40**



2002 Y.F. Appendix C: Site-specific Reports

Vale Project (Author: Bob Kindig, Editor: Roger Mithenz, Ed Spang), pages C1-C11

Jaridge Field Office (Author: Gary Blinow), pages C12-C22

Uncompahgre Plateau (Authors: George Hollis and Dave Wickstrom), pages C23-C31

Blue Mesa (Dave Wickstrom), pages C32-C38

Lander (Author: James "Smoky" O'Connor), pages C39-C40

Wohand (Author: James "Smoky" O'Connor), pages C41-C42

Indian Resource Area, Vale District, Oregon  
Jaridge Reserve, Vale District, Idaho  
Grand Junction Field Office, Colorado  
Montrose Field Office, Colorado  
Lander Field Office, Wyoming  
Wohand Field Office, Wyoming



***Eastern Oregon: The Vale Project***

Bob Kindschy, Al Logosz, Chad McBurney, Roger Mertens, Ed Spang

Field Notes from Legacy Program tour of a portion of the Vale District,  
Bureau of Land Management: August 2002

**Facilitators:**

Bruce Van Haveren, NSTC Denver  
Bill Wagner, Utah

**Retired BLM Professionals:**

Ed Spang  
Chad McBurney  
Al Logosz  
Roger Mertens  
Robert Kindschy

**SUMMARY**

\* It was unfortunate that no current BLM field staff participated during the tour. Hence all conclusions were based upon observations of present vegetative species composition, density and vigor. The only information we had to compare existing vegetation with was what we remembered and Dr. Harold Heady's 1977 evaluation of the Vale Project.

\* We recognized that year 2002 was a severe drought and several prior years also had below average precipitation. We also recognized the treatment sites were completed 35 to 40 years ago and all (except some exclosures) have subsequently been grazed by livestock.

\* We believe most chemical (herbicide) treatment projects have at least as much, if not more, sagebrush density as was present prior to treatment. An exception being several sites which have been burned by wildfire. We aged sagebrush in several seedings using saw cut cross sections which revealed annual growth rings. A majority of plants were 20 to 25 years old (1977 to 1982). Sagebrush in the Antelope and Battle Creek seedings occasionally exceeded 30 years of age. (Photo #9) Speculation as to why plant species regression was so prevalent would require data on actual use, plant utilization, trend, management plan information and weather data. Such data were not available to us. However comparison of sites open to managed grazing with those sites protected from livestock left little doubt grazing use was a major contributing factor over the long term.



## BLM Legacy Program

C-2

\* A majority of crested wheatgrass seedings now support sagebrush stands at or near pretreatment levels. (Photo's #2, 5, 8, 9, 25, and 26) Most preferred grasses, including crested wheatgrass, are of low vigor, small basal size, and greatly reduced in frequency. This was especially evident when protective study exclosures were available for comparison.

\* Facility maintenance, especially riparian fences, had been infrequent or absent in some allotments. ((Photo's #13, and 14) Informational signs were badly deteriorated and often no longer relevant due to vegetation change. (Photo #10)

\* Overall, we concluded plant species composition and density were approaching that present prior to the Vale project. (Photo's #8, 25, and 26)

\* Happily there were some neat successes. Succor Creek riparian, several "noodle-bowl" exclosures (Photo's #11, 12, 16, 17, and 19), Bogus Creek riparian communities, Jackies Butte fire rehabilitation seedings (Photo #23), Disaster Peak seeding, and the extensive riparian recovery in the Trout Creek Working Group area of concern.

\* The areas reviewed and projects viewed did not reflect the long-term goals of the Vale Project. The personnel of the 1960's and 70's for some reason didn't leave sufficient tracts to insure continued intensive field management practices. It is now imperative that present and future land manager's look closely at the past developments on the ground, present-day uses and management. In doing so, these public lands not in acceptable condition must be managed for ecological resource improvement. Further, the legacy of the past with the improvements and administration actions are lost in only a few short decades unless actions of the past remain in full view of the District Employees.

\* We respectfully request that the Vale Project efforts continue to be made available to all present and future personnel. District training programs should include in-depth information on the Project and subsequent year's activities. This would assure that the legacy would be carried forward allowing for aggressive and effective land management activities. If this is not done then the sole of the Vale Project will be lost forever.

\* We hope that our review can be used in a positive way to assure that future management and developments, affecting the biological communities are in keeping with quality resource decisions and wise management practices.

\* We thank the Bureau for the opportunity to take part in the Legacy Program and hope we may someday be asked again for our input into present day management activities.

IT WAS A GOOD WEEK



## TOUR NOTES

12 August 2002

Following a meeting with Vale BLM staff, we proceeded south through the seedings along Lytle Blvd. Consensus was that they looked good. A good mix of native grasses and sagebrush with lots of introduced crested wheatgrass.

We observed the native range and fire rehab seeding along the Adrain to Succor Creek road. We stopped to examine one of the two exclosures which looked good considering the site and drought.

Succor Creek riparian succession amazed the group. Kindschy had a 1958 35mm transparency which, when viewed at the photo site, was an amazing successional story.

Spring Creek seeding (nearest Rockville) is about gone. Spring Basin and Spring Mountain seedings look fairly good considering the drought. The Dog Creek Noodlebowl contained some water and resident willows are recovering from past mechanical work.

Big Ridge seeding was hiked at two stops. A search revealed Nomad alfalfa scattered sparingly at each site. This seeding is 36 years of age. All of us remembered this seeding as one of the best in the district. The April 2002 Southeast Oregon Resource Management Plan ranks this seeding as "excellent" with "static" trend, when, in fact, it is difficult to recognize as a seeded site. (Photo's #2, 3)

Shellrock brush control is no longer evident, as seemed typical of many sagebrush herbicide treatments locally.

Schnable Creek seeding looked good. Much of the area has burned at least once since treatment. No sagebrush is present throughout a large, adjacent area. There is a lack of habitat diversity as a consequence.

Mud Lake well and northwestern Cow Creek present a vast landscape of bunchgrasses. A pipeline from the well was providing water for the cattle seen grazing. A beautiful rangeland aspect except for a total lack of sagebrush. We believed this to be largely a result of fire coupled with a lack of sagebrush seed sources and historically conservative livestock use.

Owyhee Butte seeding complex pastures were all closely grazed. In fact cattle were still present. It is likely little growth occurred due to drought. Much of the area needs a close management watch to preserve the crested wheatgrass as sagebrush appears to be increasing quite rapidly. Pasture #4 appeared to have burned recently which showed what controlled burning of sagebrush encroached seedings can accomplish. (Photo's #4 and 5)

13 August 2002

We spent time at the CCC exclosure of 1939; it is adjacent to the Antelope seeding. This is an important "bench-mark" site which, like most of the



livestock exclusion sites throughout the District, provides an opportunity to judge management effectiveness on adjacent rangelands. (Photo's #6 and 7)

Antelope seeding was very closely used. Cattle had made a thorough and complete search for grass. Stockmen were gathering and removing cattle as we toured. Grasses appeared weak while sagebrush is filling the void. This seeding, once a beautiful stand of crested wheatgrass, has but a brief future under present management. The same applies to the adjacent much more recent control burn and seed site. We suggest the interpretive sign be removed considering the present condition of this site. (Photo's #8, 9 and 10)

The recent RMP showed all suspended livestock use in the Antelope Allotment have been restored and identifies the Antelope and Greeley seedings as "excellent seedings" with static trend. (Photo's #8, 26 and 28) From what we observed we must question why livestock use was restored as well as the condition and trend of these seedings.

Cantor Corral pit or "noodle-bowl" was almost dry. Protected riparian and upland vegetation looked wonderful. (Photo's #11 and 12)

The reservoir which stores water for the long pipeline across the bottom of Antelope (irrigation) reservoir was almost dry and full of cattle. The site is fenced to exclude stock but the gate was thrown back, which, according to Kindschy, is often the case. (Photo 13)

We inspected an old spring development which still is producing water but the pipe to the tank is not functional so cattle and wildlife have but a mouthful every minute or so. Likely a case of non-maintenance on the part of stockmen as well as a lack of enforcement on the part of BLM. (Photo's #14 and 15)

Higher elevation rangelands looked fairly good. Gluch Pit enclosure exhibited beautiful near "climax" upland vegetation. (Photo 16) The pond was full and spilling. Riparian vegetation presented a most pleasing aspect. (Photo's #17, 18 and 19)

Gluch seeding had been cleaned to the soil surface. (Photo #20) No cattle present but some water troughs were full for wildlife use. Unfortunately this was the only instance of this we observed during the four day tour. It had been Vale District policy to maintain water in pipeline systems until autumn draining. We seldom observed "bird ramps" in water troughs during the tour.

We then made a quick stop at the Rock Creek Reservoir to look at the wildlife islands. (Photo's #21 and 22)

Fire rehab seedings in lower elevation of Jackies Butte looked amazingly good; excellent establishment with a good mix of plant species. (Photo's #23 and 24)

Winter range area is nearly devoid of all vegetation except a sparse stand of one or two inch cheatgrass. Although drought aggravated, there are few desirable perennial plants present.



Beautiful 8,900 acre Battle Creek seeding appears to have been lost. A search under the abundant sagebrush reveals a few small crested wheatgrass plants. We spent several hours examining and discussing this regression to pre-treatment status. McBurney recalled that annual cheatgrass was uncommon at the time of seeding. It is now the most prevalent grass. Such encroachment of weed plants forecasts future degradation when Halogeton and knapweeds invade the openings left by failed perennial crested wheatgrass. Was it a poor droughty site or due to years of improper management? We concluded it was likely a combination of the two. Later examination of nearby Overshoe seeding and its included protective enclosure strengthened the case for improper management as the primary cause. (Photo 25)

#### 14 August 2002

We bid Bruce, Bill and Ed goodbye this morning. The four of us past Vale District professionals headed southwest with our first stop at the Vale Project Interpretive Site. The sign needs maintenance. The fenced area around the sign shows a good comparison of a recent (1980's) protected area to heavy use in the Greeley Seeding. (Photo's #27, and 28). Our next stop was at the Rome Seeding complex of the late 1950s to early 1960s. We observed "fair" conditions but with close livestock use of the drought inhibited crested wheatgrass. Cattle were still present in some pastures. Sagebrush appeared to be increasing overall except in the areas around the well which appear to have burned in recent years. There was also an area of noxious weed invasion south and west of the well. (Photo's #29 and 30)

At Basque Station we turned east to the Overshoe seeding. It was as disappointing as Battle Creek seeding although probably not quite as degraded. There are weak little crested wheatgrass hiding beneath many of the abundant sagebrush. Overall aspect is very nearly that of pretreatment. Interesting here though, is a protective enclosure. It, like so many others constructed during the Vale Project, was seeded to three different grasses on 2/3 of the area. The remaining 1/3 was left as native vegetation. Crested wheatgrass has been successful and dominates the entire enclosure now. There is a sagebrush over story but of much less density than that common to the seeding. We concluded that the marked difference in vegetation between the enclosure and seeding was a result of livestock use of the seeding which failed to meet the physiological need of crested wheatgrass for growth, food manufacture and storage, and reproduction. Enclosures are vital sources of "benchmark" information which enable evaluation of adjacent managed rangelands. It is strongly recommended that BLM update the inventory and maintenance needs of enclosures.

Battle Creek seeding was revisited at several locations. Same degraded condition observed. A neat gravity flow water system waters the area. Remains of a wildlife watering device were observed. There had been no maintenance. In fact the device had been removed and the protective fence was a tangle of downed wire. There was no water in the troughs for wildlife in spite of the no cost gravity flow system. The source was visited and had lots of spring fed water. The whole area appeared unmanaged and degraded.

Thence eastward through native rangelands to the Potomac camp and eventually the excellent old CCC road which we took to an early riparian



fisheries success, Rattlesnake reservoir. It had been fenced during the Vale Project and is stocked with trout by Oregon Department of Fish and Wildlife. The site is at the junction of the road to Anderson Crossing and Star Valley so is very popular with the public. In addition, normally abundant sage grouse and pronghorn antelope frequent the area. The reservoir was nearly full of cattle. Fences were down and appeared to have been abandoned for many years. All riparian vegetation had been reduced to a green hew of the soil. We, and surely the visiting public, wonder what the permitted rancher and administrating BLM were thinking.

Echave reservoir had been similarly fenced and had been a trout fisheries. It mirrored the conditions of Rattlesnake reservoir.

Antelope creek in Lucky Seven (ex Campbell) allotment was visited. Good stands of willow and associated riparian vegetation are present although likely less than in the recent past. Uplands seemed about as we had recalled in the past. We suspect past grazing systems, permitted numbers of stock, and utilization standards are not being followed.

Two permittees, independent of each other, asked our group: "When was the last time BLM counted cattle?" This suggests that running more stock than licensed may be rather common. We couldn't help but wonder what the utilization, actual use and trend studies have been showing. It was a pity we weren't accompanied by some Vale range personnel.

Highway 95 splits two concurrent fire rehab seedings of the 1990s. The seeding on the east looks good while the west and larger seeding appears to have lost much of the original crested wheatgrass and is choked with Russian thistle. Because all environmental factors except grazing were equal one would have to address that issue.

Bankofier spray and seed area looked very good. Likely a product of thoughtful management

Bretz seeding was of especial interest to Chad McBurney. We were all pleased with its appearance and condition after 35 years. This was considered the most droughty site seeded in the Southern Resource Area. It's condition now tells us something about livestock control and use when compared with most of the seedings we visited.

#### 15 August 2001

Disaster Peak seeding was generally in good condition. The fourwinged saltbush which was aerially seeded prior to drilling crested wheatgrass was most impressive.

Disaster Peak exclosure proved most interesting. One of the best stands of Whitmar wheatgrass we have seen dominates the northern test seeding. An excellent stand of crested wheatgrass occupies the southern portion. Intermediate wheatgrass is in the center but is much less in production although ground cover may be greater than that of the bunch grasses.

Native grasses in the untreated uplands of Zimmerman Allotment and Whitehorse Allotment looked fairly vigorous and appear to be at least stable in trend. Shallow soils typical of the mountain top may limit potential for improvement in the short term.



Whitehorse seeding was used but lightly if at all this year. It looked much improved from prior years according to Kindschy.

Little Whitehorse Creek exclosures wowed everybody. A realization of fantastic site potential.

Willow Creek, both managed rangeland and 1986 exclosures, proved to our group that riparian ecosystems can experience successional improvement with proper grazing. The Hot Springs area was most impressive with its forest of willow and strong flowing clear stream water.

On the return to Vale we visited the Hooker Creek seeding. Again the 2001 RMP lists this an "excellent seeding." It did appear in better condition than adjacent Big Ridge seeding but crested wheatgrass plants were sparse, show poor vigor and moderate to heavy livestock use. This is one of the older seedings in the district and, in the 1960s, was very productive. This was also the first seeding where a two pasture spring use rotation was implemented. We don't know what management changes have been made over the years but the low vigor of the crested and increase of sagebrush indicate a need for change.

Each of us wrote of our observations and shared them. We were in strong agreement that ecological problems were very evident. Although the urge to assign blame was strong, we felt present land managers -- both BLM and livestock grazers -- should review the files for past records of condition and trend, actual use, utilization, weather and climate, trespass and project maintenance.

On 16 September Jordan Field Officer Jerry Taylor and Range Conservationist Cameron Rasor joined Bob Kindschy to visit many of the troubled seeding sites. We agreed with the observations of this report. Further, we developed a strategy to correct major problems including rehabilitation, where required, due to a lack of desired perennial plant species. No action threatens such sites with noxious weed invasion. Site specific strategies will be developed in the spring of 2003 following plant growth.

## I. Project Description

### A. Name of Project or Area

Vale Rangeland Rehabilitation Project

### B. Location (field office, allotment., watershed)

Vale District, Jordan and Malheur Field Offices

Allotments we looked at include

Three Fingers, Rockville, Spring Mountain, East Cow Creek, Mahogany Mountain, Schnable Creek, McCain Springs, Lodge, West Cow Creek, Antelope, Willow Creek, Jackies Butte Summer and Winter, Campbell, Eiguren, Gilbert, 15-Mile Community, McCormick, Zimmerman, and Whitehorse Butte

### C. Project Objectives (what were the stated project objectives?)



Congress appropriated approximately \$10 million over a 10 year period beginning in 1962 to halt erosion, stabilize the livestock industry, and benefit other land uses. Supervision and management of the land uses were large parts of the Vale project.

The Vale project was a pilot program where resource conservation practices were intensively applied to an entire BLM district. The project was to be of economic importance to those directly benefiting, but it also was of importance to all of the areas in the western United States where similar conditions exist. The dynamic program of the Vale project was to serve as an example for similar actions in many other places. Investments were designed to increase the productivity and benefits of the public lands during the project years and for generations in the future as well.

#### D. Management Goals (in terms of longer term expectations)

##### 1. Resource values

Increase the usefulness and productivity of BLM-administered lands.

Conserve soil and moisture to correct damage caused by erosion.

Control the encroachment and spread of noxious weeds.

Stabilize the livestock industry at the present or an increased level of production.

Maintain and improve opportunities for wildlife and outdoor recreation.

##### 2. Vegetation changes

Treat 700,000 acres with aircraft-applied herbicides (24D) where studies show there was sufficient native grasses to respond to brush removal. Plow and seed 400,000 acres where perennial grasses are so depleted that they cannot be restored by any other means. More than a thousand watering sources were planned for the Vale District (Wells, pipelines with multiple water troughs, reservoirs and spring developments). Improve range condition and trend on the remaining Public lands through proper use of the treated areas and intensive grazing management on the remaining native range.

#### E. Pre-project baseline data and/or monitoring

##### 1. Transects or plots

Fenced exclosures throughout the district starting in 1939 and continuing into the early years of the Vale Project. Each exclosure contained transects and photo points as well as various land treatments, different plant species seeded, and undisturbed control areas.

##### 2. Photo points

Trend plots were first established in the treated areas starting in the mid 60's. These consisted of 3'X3' photo plots and wide angle photo shots. Browse transects were established and read in selected areas throughout the District.

##### 3. Type and location of documentation

The study, project and allotment files should be located in the District Office in Vale.

## II Implementation

### Implementation dates (when implemented?)

Between 1962 and 1972



**Describe treatments**

From the 1977 Heady report the following was completed through 1973.

Brush Control	506,570 acres
Seeding	267,193 acres
Fencing	1,994 miles
Reservoirs	583 each
Springs	440 each
Wells	28 each
Pipelines	462.9 miles
Water troughs	538 each
Cattle guards	360 each
Exclosures	69 each

**Post-project land management**

1. Fencing, water developments  
Unknown
2. Grazing system (stocking rates, season of use, initial rest)  
Of the 20 allotments we visited only 8 are under AMP's.
3. Follow-up treatments (e.g. prescribed fire)  
None that we know of

**Post-project monitoring**

We were told that some range studies are being conducted each year but the team was not provided access to this data.

1. Transects or plots
2. Photo points
3. Type and location of documentation

**III. Results.****A. Observations and conclusions**

See attached report

**B. Were objectives met in terms of project objectives?**

No

**C. Were expectations met in terms of longer term goals and expectations?**

No



D. Other conclusions (vegetation composition, cover, wildlife habitat, overall land health)

See attached report

***E. What would you do differently today***

See attached report and recommendations listed below

Put in place field level resource objectives

F. What are the lessons learned that could be applied in this area in the future?

Review the past actions

Document ongoing activities

The Vale District is in a very fragile ecosystem (Annual precipitation less the 10 inches per year) that needs intensive management and close supervision.

IV. Recommendations

A. What recommendations do you have for the current field manager?

1. Follow-up treatments?

Spring prescribed fire in many of the old land treatment areas followed by two growing seasons of rest and management plans developed to manage and maintain the health of the important plant community.

Additional water developments to provide for better and more even distribution of livestock grazing. Additional water should only be developed in conjunction with intense AMP's that are properly studied and supervised.

Project maintenance must be enforced. If the livestock operators have this responsibility then they must be held accountable or they do not turn out. We do question if the operators have the equipment and time to do some of the spring, well and pipeline maintenance. The Bureau should maintain wildlife, riparian, etc. projects and supervise their use or non-use.

2. Management?

Of the 20 allotments we visited only 8 are under AMP's. Allotment Management Plans have been a part of BLM since the late 60's and it is surprising that so many in the Vale district have not been completed

3. Monitoring?

Allotment monitoring studies (Trend, actual use, utilization and weather) should be kept current and summaries posted in each allotment file for use by the range staff.



Ed Spang

Chad McBurney

Al Logosz

Roger Mertens

Robert Kindschy



## BLM Legacy Program

C-12

BLM Legacy Program Visit  
Jarbidge Field Office; Twin Falls, Idaho  
Gary Blincow, Natural Resource Specialist, Worland Field Office, Wyoming

### Trip Agenda:

Monday, 8/12/02: Travel from Worland to Twin Falls.

Tuesday, 8/13/02: Met with the Field Office Manager, Eddie Guererro. Reviewed project files of possible seeding and brush control projects to visit. I selected 8 projects to visit for the field tour to be held on Thursday. I started on a preliminary project visit field trip.

Wednesday, 8/14/02: Traveled to all of the selected projects in the field to locate observation points and routes. I located some old photo locations that I had and duplicated the photographs.

Thursday, 8/15/02: I met with the other Legacy participants at the Field Office. We traveled to the selected project sites to view and discuss crested wheatgrass seeding, chemical brush control and seeding after wildfire.

Friday, 8/16/02: I closed out with the Field Office Manager and staff, and left for Worland.

The selected project sites that we visited are listed as follows:

1. Upper Pot Hole Plowing and Crested Wheatgrass Seeding (Project # 1608)
2. Three Tip Plowing and Crested Wheatgrass Seeding (Project # 4023)
3. Buffer Sagebrush Plowing and Crested Wheatgrass Seeding (Project # 1116)
4. Buffer Extension Plowing and Seeding Crested Wheatgrass (Project # 1198)
5. Buffer Extension Re-Drill of Crested Wheatgrass (Project # 1199)
6. Balanced Rock Plowing and Crested Wheatgrass Seeding (Project # 1009)
7. Coonskin Chemical Sagebrush Spraying (Project #1163)
8. Grassy Hills Wildfire Seeding (Project # 0152)

The people that were on the field tour, along with me, are as follows:

Dave Krosting, Acting DM; Eddie Guerrero, FM; Bruce Van Haveren, NSTC; Bill Wagner, RET.; Mike Courtney, RMS; Arnie Pike, RMS; John Ash, NRS; Gretchen Heaser, Wildlife Temp.; Jay Baker, Range Temp.; Michelle Hesselbacker, Range Temp.; and Jarbidge Area Ranchers, Rollie Patrick, Vernon Lehmann and Chuck Jones.



## TOUR STOP 1

Upper Pot Hole plowing and seeding  
Three Tip plowing and seeding

We stopped at a site which was the original boundary line between the Upper Pot Hole seeding and the Three Tip seeding.

## Upper Pot Hole Plow and Seed:

## Objectives:

To plow up of 3100 acres of sagebrush and follow up seeding to crested wheatgrass to restore adequate vegetative cover to control the spread of host plants for the beet leaf hopper and to conserve soil and moisture resources and increase livestock and wildlife forage. A dense stand of quality perennial grass needs to be established.

## Goals:

When in production this seeding will be used as a management tool for the Saylor Creek Unit by helping to relieve the loss of Federal Range to livestock use, due to the Desert Land Act land disposals.

## Project Implementation:

The project started on September 8, 1967 and was finished on October 25, 1967. 3,560 acres of sagebrush rangeland was plowed and seeded to crested wheatgrass. The plowing was done using a 20 foot Towner offset disc, pulled by a D8 cat. The seeding was done using a standard grain drill with big log chains used as a drag to cover the seed. The seeding rate was four pounds per acre. The plowing cost was \$2.97 per acre and the seeding cost was \$1.49 per acre. The total cost including administrative charges was \$6.24 per acre. Total project cost was \$22,214.

## Monitoring:

No monitoring studies were established. An evaluation of the seeding success was completed in 1968, which stated that it was a good seeding and that it was recommended that the area did not need to be re-seeded.

## Photo Points:

No photo points were established.

## Management:

The initial use on this seeding was by sheep for early spring grazing. There was no water in the area and the water had to be hauled by truck to the sheep bands. There are now extensive water systems, fencing, allotments and pastures in the area and the grazing use is by cattle.

## Observations and Conclusions:

It is now not possible to tell where one seeding stopped and another started. Many more acres in the area have been seeded. Some of this original seeding is still free of big sagebrush. Probably the reason for this is because of repeated wildfires which have burned off the sage brush and destroyed the seed source.



## Three Tip Plow and Seed

## Objectives:

This project is justified as meeting the objectives in the Boise District Summary, the Jarbidge URA and the Owyhee Project. The Saylor Creek Unit has the greatest potential for increased forage production through brush control projects and grass seeding, combined with intensive livestock management systems than any other unit in the Owyhee project.

## Goals:

Upon completion of this project partial fulfillment of the following goals can be realized.

- 1) Livestock use will be shifted from the Tindall and Pole Creek units in the Bruneau Resource Area, which in turn will receive use shifted from the over obligated range in the Owyhee Resource Area.
- 2) Livestock use will also be shifted from other parts of the Saylor Creek Unit and from the Southside and Hagerman Units which have been reduced in size as a result of Desert Land Entries, thus lessening or canceling the effect of public land disposals on the local livestock industry.
- 3) With the increased forage production, water development, fencing and initiation of grazing management plans, conversions from sheep to cattle will also be possible.
- 4) The development complex which includes seeding, water development and fencing will include provisions for improved wildlife habitat.
- 5) This development work has to be done as soon as possible because the livestock shifts from other areas are needed immediately or those areas will suffer even more than they have in the past. If livestock from areas of past and future Desert Land Entries cannot be shifted, then those operators face the very real thought of reduction or even cancellation of Federal Range grazing privileges.
- 6) Three projects are included in this project complex. They are the Three Tip plow and seed (9100 acres), Bruneau Canyon plow and seed (1700 acres), and No water plow and seed (7900 acres).

## Project Implementation:

The project was started in April of 1969 and completed in July of 1969. 6,320 acres of sagebrush rangeland was plowed and seeded to crested wheatgrass. The plowing cost was \$2.69 per acre. The seeding contract was separate and was completed in November of 1969. Grain drills were used but they had depth regulators installed on the discs. The drilling cost was \$3.20 per acre. Total cost of this project was \$37,100.

## Monitoring:

No monitoring studies were established. A project feasibility was completed in 1968 which stated that the rangeland carrying capacity was 22 acres per AUM before seeding. After seeding the estimated carrying capacity would be 1 acre per AUM for spring grazing with sheep.

## Photo Points:

None were established before the seeding was completed.

## Management:

The entire area of crested wheatgrass seeding is now managed very intensively. There are extensive water systems, fenced allotments and pastures and livestock handling facilities. The livestock use is now cattle.

## Observations and Conclusions:

Most of the Three Tip seeding is now heavily infested with big sagebrush. The under story of grass is dominated by crested wheatgrass, sandberg bluegrass and cheat grass. In our discussion at this site it was brought up that at least some of the original goals of this project were accomplished. One of those was the move of livestock use from the Hagerman and Southside Units onto these intensively managed seeded areas. These grazing units lost thousands of acres of rangeland to private development of potato farms under authority of the Desert Land Act. Another objective that was obviously met was the conversion of sheep AUM's to cattle AUM's. Before around 1970 all of the use in the interior portion of the Saylor Creek Unit was by sheep in the early spring. All of the livestock water had to be trucked into the area from a very few water wells. After around June 15 there was no livestock use in the area until the next spring turnout date. Due to the lack of summer water there were no Antelope or Sage Grouse in the area. It is interesting that one of the original goals for the justification for these



seeding complexes was never achieved. That is that no livestock were moved from the Tindall and Pole Creek Units of the Bruneau Resource Area onto these seeding allotments. The Jarbidge Field Office is now faced with and has been for the past 30 years as to how to properly allocate all of the additional AUM's of livestock use due to the thousands of acres of crested wheatgrass seeding production. This additional rangeland productivity has for a long time been licensed as "temporary-nonrenewable" and very few permanent allocations have been made. Due to the extremely variable climatic conditions of the Saylor Creek Unit which causes great fluctuations in the range productivity this is a very complicated and difficult allocation process to go through. Another productivity problem is that some of the original seedings have been invaded by big sagebrush which has reduced the grass forage production.



## TOUR STOP 2

Buffer sagebrush plowing and seeding of crested wheatgrass  
Buffer Extension sagebrush plowing and seeding of crested wheatgrass  
Buffer Extension re-drilling of crested wheatgrass

We stopped at an observation point which is located inside of the Buffer Extension and Buffer Extension re-drill projects. The extent of the Buffer plowing and seeding project could be clearly seen in the short distance.

## Buffer Plow and Seed

## Objectives:

To provide a buffer zone between the sagebrush range and agriculture lands to help in the control of the beet leaf hopper. It will improve the soil moisture, increase livestock feed and aid in the control of soil erosion.

## Goals:

Field Mustard and Russian Thistle must be reduced or eradicated in order to combat the beet leaf hopper.

## Project Implementation:

The project was started on June 15, 1964 and completed on December 18, 1964. The project consisted of plowing big sagebrush and seeding crested wheatgrass. The plowing was done by using Towner disk plows and brush land plows. The seeding was done using rangeland drills and standard grain drills followed by harrowing. 10,500 acres were plowed and the seeding rate was 6.7 pounds per acre. The cost per acre was \$6.70. Total project cost was \$70,350.

## Monitoring:

No monitoring was included in the project. A project feasibility report was completed in 1964 before the project was started.

## Photo Points:

No permanent photo points were established.

## Management:

There were no management plans implemented after two growing seasons of rest prior to grazing use. The grazing use at that time was for spring grazing by sheep as water had to be hauled to the area by truck. There are now water systems and fenced allotments and pastures in the area and the area is used by cattle.

## Observations and Conclusions:

The original Buffer Plow & Seed which is located north west of the Crows Nest/Saylor Creek well road is still dominated by almost a pure stand of crested wheatgrass with very little invasion of big sagebrush. I do not know whether this has burned off in the last 30 years or maybe the grazing use now is different from that of a seeding where the big sage brush has re-invaded so heavily.



## Buffer Extension Plowing and Seeding

### Objectives:

This project provides an extension of the buffer zone between the sagebrush rangeland and the agriculture lands. This helps in the control of the beet leaf hopper. It will improve soil moisture conditions, increase livestock feed and aid in the control of soil erosion.

### Goals:

Field Mustard and Russian Thistle must be reduced or eradicated in order to combat the beet leaf hopper.

### Project Implementation:

The plowing portion of the contract was started on July 9, 1965 and completed on August 26, 1965. The seeding was completed on October 22, 1965. 6,927 acres of sagebrush rangeland were plowed and seeded to Nordan Crested Wheatgrass. The plowing was done by using 40 feet of Towner offset disc plows and 32 feet of Brush land plows. The seeding was done using standard grain drills followed by harrows to cover the seed. The seeding rate was 6 pounds per acre. The plowing cost was \$3.07 per acre and the seeding cost was \$3.22 per acre for a total cost of \$6.29 per acre. Total project cost was \$43,571.

### Monitoring:

No monitoring was included with this project. A project feasibility was completed in 1964 before the project was started.

### Photo Points:

No photo points were established.

### Management:

There were no management plans implemented after two growing seasons of rest prior to grazing use. The grazing use at that time was for spring grazing by sheep as the water had to be hauled by truck into the area from the Saylor Creek well. There are now extensive water systems in the area and numerous fenced allotments and pastures for grazing use by cattle.

### Observations and Conclusions:

The Buffer Extension Plow & Seed which is located to the south east across the road from the original Buffer seeding is also dominated by crested wheatgrass. In places there is some light invasion of big sage brush. Again without knowing the fire occurrence or grazing regime it is hard to conclude why sagebrush has not invaded into this seeding like it has in others close by.



## Buffer Extension Re-drill of Crested Wheatgrass

## Objectives:

To re-seed an area in the Buffer Extension plowed area that did not germinate and come up the previous year. This will provide grass for livestock forage and watershed protection on the area previously plowed in 1965.

## Goals:

To establish a good grass stand of crested wheatgrass in the area that was a failure the previous year.

## Project Implementation:

The seeding project was started on September 8, 1966 and completed on October 17, 1966. 1940 acres of the previously plowed sagebrush on the south end of the Buffer Extension plow and seed was seeded to Nordan Crested Wheatgrass at the rate of 4 pounds per acre. The cost was \$2.28 per acre. Total project cost was \$4,423.

## Monitoring:

No monitoring was included with this project. A project feasibility was completed in 1966 before the project was started.

## Photo Points:

No photo points were established.

## Management:

There were no management plans implemented after two growing seasons of rest prior to grazing use. The grazing use at that time was for spring grazing by sheep as the water had to be hauled by truck into the area from the Saylor Creek well. There are now extensive water systems in the area and numerous fenced allotments and pastures for grazing use by cattle.

## Observations and Conclusions:

The Buffer Extension Re-drill project which is located to the southwest of Saylor Creek and north of the Crows Nest/Balanced Rock road has been heavily invaded by big sagebrush. I did notice that there is very little grass understory of crested wheatgrass in this area. Most of the grasses there now are the same ones that were there before the plowing and re-seeding project was done. I am wondering if the original re-seeding project was a failure back in 1966 and the sagebrush came back rapidly in the late 1960's.



## TOUR STOP 3

## Balanced Rock sagebrush plowing and seeding of crested wheatgrass

## Objectives:

The purpose of this project is to rehabilitate a portion of the Federal Range in poor condition by establishing an early turnout area in the Devil Creek Unit.

## Goals:

Livestock would be shifted onto this seeded area, for early spring use, from grazing areas farther to the south at higher elevations. This in turn would defer the turnout date to the middle of June in the allotments to the south, aiding in improving the overall range condition.

## Project Implementation:

This project started in August of 1963 and was completed in December of 1963. It consisted of plowing 4000 acres of sagebrush rangeland and seeding it to Crested Wheatgrass. Plowing was done with two Towner plows and two Rangeland plows. Seeding was done with six BLM range land drills. The seeding rate was six pounds per acre. The cost of the plowing and seeding was \$6.07 per acre for a total cost of \$24,280.

## Monitoring:

No monitoring was ever set up for this project. The project feasibility was completed in 1962 before the project was started. A study was completed after two years of rest and before livestock use was authorized that revealed that there was a live sagebrush plant on the average of every 300 to 400 square feet.

## Photo Points:

No photo points were established on this seeding.

## Management:

The initial management for this seeding was for an early turnout pasture for cattle. The seeding was fenced and a water line was installed from the Buck Flat well to a storage tank and water trough in the middle of the seeding pasture. This management action moved cattle from the Coonskin Butte area to this seeding which deferred the use there to the middle of June. This strategy definitely helped to improve the range condition at the higher elevations to the south.

## Observations and Conclusions:

This plowing of sagebrush and seeding of crested wheatgrass has been completely taken over by big sage brush. The dominant understory grass however is now crested wheatgrass. I did notice that to the west of this original seeding is now a newer seeding. I was told that this was a seeding as a result of a wild fire. I do not know the age of it, but it is also being invaded by big sagebrush, but not yet at the sagebrush density of the original Balanced Rock seeding.



## TOUR STOP 4

## Coonskin Brush Spraying

## Objectives:

The control of big sagebrush by means of an herbicide will allow the understory of native grass, *Agropyron Spicatum* (bluebunch wheatgrass), to become dominant, thus increasing both the forage and watershed potential.

## Goals:

Sagebrush rangeland will be aerial sprayed with 2, 4-D chemical. This will reduce the brush, thus releasing the existing perennial grasses which will provide an increase in livestock and wildlife forage, which will improve soil moisture conditions and will reduce erosion. Any area which shows signs of sage grouse will be blocked out and strip sprayed to preserve the sage grouse habitat.

## Project Implementation:

This project was started on April 24, 1965 and completed on May 9, 1965. 12,000 acres of big sagebrush was to be treated. It was accomplished aerially with an Ag Cat aircraft and N3 aircraft each covering a 50 foot swath per pass. Two pounds of 2, 4-D acid equivalent to 5-2/3 gallons of water for a total mixture of 6 gallons per acre was used. In the southern portion of the project area different formulas of 1.25 lbs./ac., 1.5 lbs./ac., and 1.75 lbs./ac. were used to facilitate sage grouse habitat. Total cost per acre of this project was \$2.43 for a grand total of \$29,160. A range user of the allotment contributed \$1045 towards the cost of the project.

## Monitoring:

No monitoring was included in the project proposal. The land treatment report and project feasibility was completed in 1964. This revealed that the area had a plant density of 80%, with a sagebrush cover of 35% and herbaceous understory of 65%. Dominant understory species were bluebunch wheatgrass, western wheatgrass, sandberg bluegrass, and bottlebrush squirreltail. The Idaho Fish and Game indicated that the proposed project areas were important nesting and migration routes for sage grouse. It was agreed that on the 4000 acres in the southern portion of the project area that the rate of 2, 4-D application be reduced to one pound acid equivalent per acre. Idaho Fish and Game indicated that this rate would provide for a 70% kill of sagebrush and leave a sufficient amount of live brush to meet sage grouse requirements.

## Photo Points:

No permanent photo plots were established before this project was implemented.

## Management:

The brush control area was not used for two growing seasons. The brush control area was fenced into a separate pasture from the rest of the allotment. The allotment was fenced into three pastures and was used in a grazing management system along with the early spring use in the Balanced Rock seeding pasture. The water system from the Buck Flat well went through all three pastures of the allotment and water troughs were installed in each pasture. I was told that at the present time the allotment is still grazed in a rotational grazing scheme and the same ranch family from 30 years ago still has use in the allotment.

## Observations and Conclusions:

The entire area of the Coonskin Brush control project is now heavily dominated by an overstory of big sage brush. In several areas that I checked I did find remnants of the large bluebunch wheatgrass plants that I remember as being in dominance after the two year rest treatment before grazing. This occurrence of big sagebrush invasion after chemical treatment is of no surprise to me. Over a period of roughly 30 years I have observed numerous brush control projects in Idaho, Colorado and Wyoming where the big sage brush has invaded back to pre-treatment levels. The only ones I have observed where big sage brush had not invaded were here in Worland where the sage brush had been burned either by wildfire or prescribed fire within the time frame of around 15 years from the date of the



original project.

100% STONE

U.S. DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

OPTIONAL FORM NO. 107

To meet the needs of the public, the Bureau of Land Management has developed a system of public lands management. This system is designed to provide for the efficient and economical use of public lands, and to protect the interests of the public in the use of these lands. The system is based on the following principles:

GOALS

1. To provide for the efficient and economical use of public lands.

Montrose Resource Area, Montrose District, 1963-1973

The project was initiated in January of 1963 and continued through December of 1973. The project was designed to provide for the efficient and economical use of public lands in the Montrose Resource Area. The project was based on the following principles:

MONITORING

No monitoring system was established. A project management system was established in 1963 which provided for the efficient and economical use of public lands.

PLANT PLANTS

No plant plants were established. A project management system was established in 1963 which provided for the efficient and economical use of public lands.

MANAGEMENT

The project was designed to provide for the efficient and economical use of public lands in the Montrose Resource Area. The project was based on the following principles:

PLANT PLANTS

No plant plants were established. A project management system was established in 1963 which provided for the efficient and economical use of public lands.

MANAGEMENT

The project was designed to provide for the efficient and economical use of public lands in the Montrose Resource Area. The project was based on the following principles:

PLANT PLANTS

No plant plants were established. A project management system was established in 1963 which provided for the efficient and economical use of public lands.

MANAGEMENT

The project was designed to provide for the efficient and economical use of public lands in the Montrose Resource Area. The project was based on the following principles:



## TOUR STOP 5

## Grassy Hills Seeding

## Objectives:

To seed an area of Federal range that burned over in a wildfire of 1960. The burn is described as an undulating area of rangeland previously having a dense cover of big sagebrush with a thick understory of bluebunch wheatgrass, bluegrass and cheatgrass. The soil is a sandy loam which varies from rock free bottoms and valley depressions to very rocky ridge tops and higher slopes.

## Goals:

It is the goal of this seeding project to insure the re-establishment of a good perennial grass cover over the area burned.

## Project Implementation:

The project was started in October of 1960 and completed in May of 1961. This project consisted of drilling seed into the burn which was 5881 acres of Federal rangeland. About 3036 acres was seeded in the fall of 1960 while the balance or 2845 acres was finished in the spring between April 10 and May 3, 1961. Because of the very rocky conditions over most of the project area proper planting techniques was not accomplished. The seed drills in many areas barely left a discernable furrow. All drilling was done with standard grain drills. The species drilled were Intermediate wheatgrass and Crested wheatgrass. The total cost of the seeding was \$25,800.

## Monitoring:

No monitoring studies were established. A project inspection report that was completed in April of 1962 stated that the seeding success was fair.

## Photo Points:

No photo points were established.

## Management:

There was no intensive management implemented at the time.

## Observations and Conclusions:

This Grassy Hills area did surprise me as I thought that it would be heavily dominated by big sage brush. It looked much the same as I remember it looking, sagebrush free back 30 years ago. In our discussion about this area it was brought up that this area was burned off in a recent wildfire. So if sage brush had been present it had once again been taken out by fire. It was interesting that the original species, Intermediate wheatgrass and Crested wheatgrass that were seeded in 1960 and 1961, were still present today in the grass vegetative complex. One conclusion that we talked about at the end of this stop was that it seems that the only areas that were sage brush free today were areas that had been burned. This supports many of my other observations over my career and supports the BLM present program of prescribed fire for the control of invasive woody species. In Worland we have had a very aggressive prescribed fire program since the early 1980's. Most all of these treated areas remain Sage Brush and Juniper free today. We did implement allotment management plans and grazing systems in these allotments before and after prescribed burning treatments.



## Uncompahgre Plateau

August 2002

**David Wickstrom, Forester/Natural Resource Specialist****Montrose Resource Area, Montrose District, 1968-1973**

## I. Project Description

- A. Name of Project  
Uncompahgre Chainings  
Log Hill  
Sims Mesa  
Paxton  
Highway 90

## B. Location - Montrose Field Office

## C. Project objectives

1. Improve watershed, i.e. slow/stop erosion  
Reservoir construction, repair, and water retention, i.e. bentonite in bottoms.
2. Improve wildlife habitat (deer winter range)
3. Improve livestock grazing management
4. Public access
  - a. Road construction and repair
  - b. Public land signs installed.
5. Harvesting wood (pinion pine) for fire wood (Denver Market) juniper posts (local market).

## D. Management Goals

1. Vegetation conversion from Pinion/Juniper to grass, shrubs and forbs
2. Conversion of old stands of PJ to younger stands
3. Reduce erosion
4. Improve wildlife habitat
5. Improve range conditions to be more suitable for livestock grazing (sheep). Area historical use was sheep winter range.
6. Improve public recreation, i.e. outback jeeping, sightseeing, hunting

## E. Pre-Project baseline data and or monitoring

1. Transects or plots - None that I recall
2. Photo points - None that I recall
3. Type and location of documentation

Annual work plans, project files, notations of cooperation with Colorado Fish and Game

## II. Implementation



- A. Implementation dates 1966 - 1973
- B. Describe Treatments

Chaining, and wood product cutting (firewood and posts). A small area was set aside for green firewood cutting

C. Post-Project land management

- 1. Herded sheep grazing was in place
- 2. Broadcast burning was attempted with limited success.
- 3. Salvage of wood products
- 4. Public access - road rehab and signing.

D. Post project monitoring

- 1. Permanent wildlife transects established. Grazing use monitored
- 2. Photo points established.
- 3. Documents retained in District files
- 4. Information on the projects incorporated into planning documents.

III. Results

A. Observations and Conclusions

On the ground review of these areas found vegetation returning to pinion-juniper. If left unmanaged the areas would return to pinion-juniper. Litter on the ground from the chaining is providing greater soil stability and limiting sheet erosion. Livestock grazing use is reduced. The type of use and season still needs to be addressed if the vegetation conversion projects are to be successful. The question is how livestock grazing can be used as a tool to manage vegetation in our goal to protect watersheds. Elk use of the areas is increasing, adding a new dimension. How can the areas be managed for elk, deer and livestock? The State of Colorado Game and Fish is now emphasizing trophy elk. The challenge for BLM is to address these objectives without destroying the vegetation and degrading the watershed.

What about the needs of wildlife? How do pinion nuts from mature pines figure into the diversity of wildlife?

Urban intrusion (urban interface) into the areas is a new factor that must be addressed. The present interest in fire management to reduce the potential for large wild fires must be considered in managing the vegetation manipulated areas and the areas adjacent to them. Public education needs to be increased on the management of the land and its resources.

B. Were objectives met in terms of project objectives?

The objectives of reducing erosion, improving wildlife habitat, range conditions, and public access were met. Changing old stands of pinion-juniper to healthy vegetation with greater value to wildlife was achieved. The change brought improved watershed conditions. There was increased forage for livestock. Public access developed into the area was increased by the cat trails around and through the chainings. Many of these trails are now being used by the public. Time has brought change to these



areas. The most noticeable was the intrusion of young pinion pine and juniper. This provides for a greater diversity of plant life in the large chained areas. The challenge now is work with these resources to continue the improved watershed conditions. Further development of the chaining areas for wildlife and livestock use is being undertaken with the roller chopper and the hydro ax.

C. Were expectations met in terms of longer term goals and expectations?

The expectations for improved vegetation composition by chaining were met. To what degree over 30 years time is difficult to determine. What changes in livestock grazing were implemented? How have wildlife, i.e. deer, made use of the areas. How did these uses impact the area? Pinion pine and juniper have returned on the sites. Chaining alone is not the complete answer. Management actions must be undertaken to retain the values expected through the initial chaining. New equipment available today which was not available in the 1960s will enable resource specialists to design better treatment areas for maximizing diversified vegetation. The areas must be monitored and records kept. Past monitoring program records are missing.

D. Other conclusions (vegetation composition, cover, wildlife habitat, overall land health)

Chaining alone does not provide the final answer to management of pinion pine/juniper vegetation. It is a valuable tool, however, to begin the change of vegetation in an area. Once this action is completed management of the areas through changes of use, i.e. livestock grazing (used as a tool and not an end in itself). The same goes for wildlife. New ways of working with the plant communities through mechanical means needs to be a part of the program. Close coordination with the Colorado State Fish and Game must be maintained to assure the vegetation resources which BLM manages can support the wildlife desires of the State. Urban interface is a new challenge. The improved diversity of vegetation and how to maintain it must be explained to the public. This is a never ending process. With people now living in and adjacent to the public lands managed by the BLM more time and effort will be required to explain the benefits of land management practices being undertaken. Fire will be a major issue to address. The Montrose Field Office needs to expend more time in public relations. Adding a public relations position to the office mix is recommended.

E. What would you do differently today?

Planning vegetation renewal projects today requires greater review and analysis before undertaking such a program. The public wants to know. The tools for accomplishing the desired outcome have improved, i.e. geographic positioning systems (GPS), chaining, roller crusher, and the Hydro Ax, changing livestock use and changing wildlife use, reducing wild fire hazards.(urban interface).



## F. What are the lessons learned that could be applied in this area in the future?

Chaining of old growth pinion pine is just the beginning in developing diverse plant communities. Management of wildlife and livestock must be adjusted to ensure watershed improvement. Continued maintenance of the treated areas must be funded. Public education must be undertaken to reduce the anti-treatment forces that try to stop all such work on the land. New challenges, i.e. "urban interface," must be addressed. A greater fire danger results when building is allowed to be done on small or large parcels intermingled with the public lands. Wherever and whenever there are chainings, wood products should be made available to the public. Land treatments result in greater public access to the public lands. Utilize the latest technology to design and layout treatment areas, e.g. GPS, roller choppers, and the Hydro Ax.

## IV. Recommendations:

## 1. Follow-up treatments?

Use the latest technology to accomplish maintenance of the treated areas: GPS, roller choppers and hydro ax to create more diversified and irregular areas. Treat more often to retain the resource values desired. Where possible use fire to assist in managing the resources.

## 2. New treatments needed?

Treat areas infested with noxious and obnoxious plants. Contract with local companies to do the spraying.

## 3. Management?

Determine what the management of wildlife and livestock can do to assure the continued development of improved watersheds. No area should be a sacrifice area. Coordinate closely with the Colorado Fish and Game on wildlife management. If the vegetation is not available for changes being requested through the political aspects associated with game management, BLM must take a stand. Management at all levels must be willing to get on board to address game management impacts that are detrimental to a healthy watershed. Work closely with livestock users to assure grazing does not adversely impact the proper management of the vegetative resources and the watershed. The idea that we have always grazed this way is not a valid reason for allowing continued use that is detrimental to the watersheds and the vegetation needed to keep them healthy. Hire a public affairs officer to lead in educating the public on responsible land management. The building issues relating to "urban interface" must be addressed. Land signing must be a primary program. If a sign goes down, is damaged or disappears, a new one must replace it in short order.

## 4. Monitoring (use supervision and long term monitoring)

Use supervision: All permitted uses must be supervised. BLM must be very active on the ground. I sense that today's employees spend the majority of their time in the



office whereas 30 years ago the opposite was true.

Long-term monitoring: When the chainings were completed, wildlife and grazing monitoring systems were installed. Those included permanent plots and photo stations. Our review found that there no longer was record of all the work that was done in this regard. Attempts are being made to recapture information to establish a base to build continued long term monitoring programs. Why did these programs disappear? It does not reflect well on BLM as a responsible land manager when information is not recorded and passed on to succeeding employees. To continually start from scratch every time a vegetation treatment program is proposed does not make sense. We must learn from the past if we are to have a future.



## LEGACY PROGRAM REPORT

## Uncompahgre Plateau

(August 2002)

## I. Project Description - Pinon-Juniper Chainings

A.&B. Project Names - All Located in the Uncompahgre Field Office, Montrose, CO (Uncompahgre Plateau).

1. Simms Mesa Chaining
2. Paxton Chaining
3. Hwy 90 Chaining
4. Log Hill Mesa Chaining

## C. Project Objectives:

1. To Remove pinion juniper canopy and release vegetative under-story.
2. To create irregular open areas within the dense P-J cover.
3. To leave cover strips in P-J for wildlife cover belts.
4. To increase ground litter and reduce runoff and local erosion.

## D. Management Goals

Resource Values

- a. To improve watershed and reduce erosion.
- b. To increase grass forage production; Parts of Log Hill Chaining were burned to reduce the over-story (trees and shrubs) and increase grass production.
- c. To increase browse and forb production.
- d. To open areas for public use (hunting).

Vegetative Changes

- a. To remove P-J canopy and release vegetative under-story particularly the grasses, forbs and shrubs.
- b. To create irregular open areas within the dense P-J cover.
- c. To leave cover strips and islands in P-J for wildlife cover belts.

E. Pre-Project baseline data and/or monitoring completed on two year old and older chainings in 1971 (Simms Mesa, Sawmill Mesa, Log Hill Mesa, Paxton, and Hwy 90 and others). Studies completed on each chaining include:

- a. One to two transects [100 point paced transects].
- b. Pellet groups were counted within a 11.9' radius of every tenth plot along a each paced transect (ten each transect).
- c. Photos were taken along the line of the transect; no photo plots were established.
- d. Documentation included a Report and Evaluation of all Two Year Old and Older Chainings within the Montrose District in 1971-1972. This evaluation was to provide a baseline of data including plant species composition, frequency, ground cover, browse condition, age class, and utilization, and big game distribution and use. Information was to be analyzed with other data including grazing and watershed studies along with winter range data (plant utilization, animal distribution, and browse condition, age class and trend) for deer and elk collected on a game unit basis.



Additional studies (production, frequency, species diversity, etc.) have been taken since 1986. Wildlife biologist has the records.

## II. Implementation

### A. Project names

Simms Mesa Chaining - 1967-68 (est.) Seeding unknown.

Paxton Chaining - 1969-70 - seeded by dribbler on cat (?).

Hwy 90 Chaining - unknown

Log Hill Mesa Chaining - 1967-68 - hand seeded, seed dribbler mounted on cat (?).

Sawmill Mesa Chaining - 1971-72 - aerial seeded and hand seeded in open root holes and under chained trees, etc.

B. Treatment included two D-10 Cats pulling an anchor chain between them which knocked down the trees. The area was seeded by dribbler mounted on each cat track as well as hand seeded (browse and grass) in selected sites.

C. Post-Project land management - some areas were roller chopped or hydro axed (Simms Mesa, Log Hill, Paxton), some were hydro axed (Simms Mesa), and others were burned (Paxton, Log Hill, and Simms). The Hwy 90 chaining was completed on a marginal site (rocky and shallow soils) and as a result, no retreatment has occurred since the chaining. Any other treatments- unknown.

D. Post-Project Monitoring - studies (production, frequency, species diversity, etc.) have been taken since 1986. Wildlife biologist has the records.

1. Field Office Study may include clip and weigh plots within the treated areas.
2. Photo points established with clip and weigh plots.
3. Folder containing all study data with photos kept in wildlife specialist office.
4. No cross-walk to prior existing studies conducted in 1971-72.

## III. Results

### A. Observations and conclusions.

1. Generally, the debris created by old chainings had been decreased substantially by wood cutters, normal decay, burning, and roller chopping and hydro axing treatments. Where old chainings were not retreated (roller chopped or burned) the P-J was actively invading the site with old debris very noticeable and more prevalent on site. Where old chainings were roller chopped, P-J was reduced and browse plants were prevalent, well distributed, and showed good growth. Actual vigor of browse plants is unknown, but moderate to heavy utilization may be occurring on most treated sites. Roller chopping over newer pinon trees caused trees the trunks to split or crack except for the smaller trees (less than 1" dia.), but juniper trees were not affected. On retreated areas some of the browse productivity and vigor seemed to out weigh the heavy utilization in some areas. On the hydro axed sites (Simms mesa) trees and piles of wood debris were reduced to scattered wood pieces and chips.

Evaluations on two year old and older chainings completed in 1971-72 indicated that kills on pinon trees were very high compared to juniper which were resprouting from any part of the tree root still in the ground. Even in these early chainings reinvasion was recognized as a problem and



maintenance of these sites was discussed. In the 1970's, browse plants were limited or scarce on P-J sites depending upon the over story, and if browse was available desirable plants were severely clubbed. Chaining of P-J over sites with browse plants provided debris which sheltered the browse plants from grazing and use by wildlife. The evaluation (1971-72) indicated that where these browse plants were protected, branches exhibited greater annual growth and were more vigorous.

B. Project objectives appeared to be met on those sites with retreatment or maintenance of these chained sites. Without retreatment, sites return to the P-J over story with evidence of the old chaining debris and little vegetation beneath (Simms Mesa site).

C. Expectations were met in terms of longer term goals as long as re-treatments were applied, especially the roller chopping and hydro-axing. Fire treatments were successful where there was a quantity of debris on the ground. Fire also reduced the variety and quantity of plants (mainly browse) used for wildlife during winter months. The overall effect of burning large areas greatly reduce browse plants and increased the grass and forb production. Although, forb production seemed to be low on most sites.

D. Other conclusions - The treatments were done to increase vegetative (browse, grass, forb) production, but reinvasion of P-J into old chainings clearly shows that retreatment of old chainings is necessary to maintain these sites as open diverse vegetative communities that offer good wildlife habitat, grazing forage, and watershed protection. One observation made was that 35+ years ago deer winter range was lower down on these mesas in the mostly sage brush communities. Most of the spring utilization studies were completed on these lower winter ranges. Some of the higher portions of these ranges did have mountain mahogany, service berry and oak scattered throughout the sagebrush parks. However, except for early spring use by deer and elk as they followed the melting snow line, the higher elevations that had the better stands of browse were not heavily used except in very open winters. It would appear that there has been a climatic change on the Uncompahgre Plateau that has allowed winter use by wildlife to occur at higher elevations on the plateau. This was evident in the chainings (retreatments) on Paxton and Log Hill and some heavily browsed sites on Hwy 90.

E. What would I do differently today? - I would discontinue prescribed burning on large treated areas and continue the practice of burning or hydro axing individual trees or brush piles to create the open canopy and park-like appearance of these treated areas. Some debris piles should be left for wildlife cover. During drought seasons/years livestock grazing should be delayed/postponed on treated areas until seed ripe.

F. One major lesson learned is that the filing system for permanent files in place during 1970-73 was good, but the system did not provide adequate protection for permanent records filed in 6500 and 6600 series. All inventories and studies/evaluations completed from 1970 to 1973 were all filed in accordance with the records system. However, these records have been lost or destroyed since then.



### G. Recommendations

1. Retreatment of these old chainings is needed to improve/maintain the under story browse, grass, and forb species.
2. Continue retreatment/maintenance of the old chainings to reduce/slow down P-J reinvasion of these sites. In areas where P-J has reestablished a good stand of young trees 8-20 feet tall, treatments with the hydro-chopper should be considered to reduce the tree canopy and regain an open and diverse tree-browse-grass site that supplies adequate cover and food for wildlife.
3. Discontinue prescribed burning on large treated areas. Limit burning to individual trees or brush piles to create/maintain the open canopy and park-like appearance of these treated areas. A scattered tree and shrub appearance that prevents line of sight through/across the treated area is the best cover for wildlife (Paxton and parts of Log Hill chaining).
4. Sites like Hwy 90 that offered little results from the original chaining, may offer some improvement in areas where the browse plants (oak, mountain mahogany, serviceberry, and some bitter brush) occur more frequently. The hydro axing of small areas (trees) through out the chaining may increase vigor of browse plants and increase wildlife use.
5. Maintain a 2-3 year moratorium on grazing of treated areas and/or until the treated area has reached a reproductive capacity that can sustain the intended grazing pressure. During drought seasons/years do not permit livestock grazing on treated areas for two years or more depending upon site and plant conditions.
6. Increase awareness of all employees about the importance of the retention of permanent files such as studies, inventories, evaluations, photo plots, etc. that program specialists worked diligently to establish/collect and complete. Establish the policy that each study, evaluation, inventory completed for a program/initiative is vital to management and must be preserved within the BLM records system.
7. Use volunteers (BLMers who are retired) or rehire annuitants to help field and/or office professionals with work that should be done, but cannot be accomplished without additional help such as: monitoring and evaluation studies, project supervision, records management, etc. Many retirees may be looking for just the right opportunity to get involved with field work again. Utilizing retirees as resource advisors for their experience, knowledge, perspective/view points, and/or just their expertise and skills to get the job done may be a large untapped resource for BLM.

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## Blue Mesa

August 2002

**David Wickstrom, Forester/Natural Resource Specialist**

Montrose Resource Area, Montrose District, 1966-1973

## I. Project Description

## A. Name of Project

Blue Mesa Timber Sales and Reforestation

## B. Location - Gunnison Field Office

## C. Project objectives

1. Maintain allowable cut
2. Clear areas previously clear cut - pile and burn
3. Replant by seeding, machine and hand planting
4. Develop road system that would be available for future forest resource management.

## D. Management Goals

1. Maintain allowable cut
2. Species conversion plant lodgepole pine (as a cover crop).
3. Protect water sources (Springs) from livestock use
5. Improve public access, i.e. outback jeeping, sightseeing, hunting
6. Close reforested areas to grazing
7. Monitor spruce seed cycles
8. Resolve timber trespass

## E. Pre-Project baseline data and/or monitoring

1. Predetermined allowable cut and time to regenerate a stand of timber.
2. On the ground review of cut and uncut areas
3. Type and location of documentation  
Annual work plans and timber sale contracts.
4. Locating and marking section corners and determining property lines

## II. Implementation

## A. Implementation dates 1966 - 1973

## B. Describe Treatments

Timber sale preparation, i.e. cruising, road layout and acquiring access



Past timber sale salvage and reforestation, i.e. piling and burning, planting

C. Post-Project land management

1. Yearly monitoring of planted areas to determine survival success of seedings
2. Broadcast burning successfully removed heavy concentrations of wood debris
3. Salvage of wood products - mine timbers for the coal mines near Paonia and long poles for teed lot bunkers in Nebraska
4. Daily monitoring of grazing to keep sheep out of forest restoration areas

D. Post project monitoring

1. Yearly sampling over planted and seeded areas to determine mortality

III. Results

A. Observations and Conclusions

A one-day trip was taken by Bob Carruthers (District Forester during this time) and myself. We drove to several sites to revisit how forested areas had reestablished in the past 30+ years. Sites visited:

Cox's Park Middle Blue

Darryl Duncan Memorial Forest

Big Blue Ridge timber sale and road construction project..

The first observation was the improved road up the Little Blue. Access to the public lands is now readily available to automobiles. Overall the general view was most pleasing. The signs of timber harvesting of the 1960s were now mostly covered or surrounded with new trees. Areas cleared, burned and planted had more aspen than what we expected. The development of the private land adjacent to BLM lands will impact future timber harvesting and forest management activities. The issues associated with "urban interface" are with BLM on the Blue.

B. Were objectives met in terms of project objectives?

Meeting the allowable cut was a challenge in light of the large areas that had been clearcut or had all large diameter trees removed resulting in wind throw. Past timber sale areas were a jungle with a large amount of wood debris on the sites. No two sites were exactly alike. The forestry program was based on immediate reestablished stands through planting.

The Forest Service was not having much success in planting spruce on their timber harvest sites. The high elevation, light intensity, livestock grazing and wildlife (elk) use made forest regeneration very difficult. Sample plantings on the BLM sites were not successful. A decision was made to plant lodgepole pine as a cover crop to reestablish the sites for spruce management. Evidence found lodgepole pine trees had once been on the sites. The Cox's Park and Middle Blue areas were piled and



burned. Cox's Park was then machine-planted with Lodgepole Pine and Douglas Fir (on the far end where Douglas Fir had been). We found only two Douglas fir trees. Both were not doing well. Contours constructed were no longer evident. Was the area returned to grazing? Did elk graze the fir? Was the site to extreme?

The Middle Blue area was piled and burned. A rodent survey was undertaken which showed a high population of mice and chipmunks in the cleared area. The area was treated to reduce the number of these creatures. The area was seeded with Lodgepole Pine seed late in the Fall prior to a snow storm. The seeding was a success and a good cover of pine trees sprouted and survived the summer. Each year the numbers declined, primarily due to frost heave. Spot planting was undertaken.

New timber sales were planned and marked to maintain a forest stand on the sites. Regeneration would be by natural means.

C. Were expectations met in terms of longer term goals and expectations?

The assumptions made in determining the allowable cut and regeneration were shown to be flawed. The amount of timber readily available could not sustain a high allowable cut. Clearing timber sale areas by piling and burning requires much longer to regenerate than predicted. Instead of a stand being established on the site in 1-3 years, a time period of 10-30 years was more likely. Regeneration by planting is costly.

The Big Blue Ridge timber sale came closest to meeting forest management objectives to maintain a healthy forest environment. The drive is a very pleasant one. Young spruce and alpine fir were found along the road. A requirement of this sale was clearing all wood debris from the road construction area and piling it in selected disposal areas. I was most pleased to drive this road and see what I had planned was successful. Large piles of slash to be burned resulted from this approach. The burn areas need to be reviewed much closer. Some time will pass before these areas are again covered with trees. When were they burned? We did not have time to walk through the cutting areas or the burn piles. Overall the forest cover as seen from the road was good. Few places showed the marks of timber harvesting. There's a high volume of wood debris in the forest. This debris was a concern when the sale was prepared.

The Darryl Duncan tree planting area was viewed. The forest is an open stand of lodgepole pine and alpine fir. To the general public, the area would look natural. This area was posted off-limits to grazing? How long did this posting last and was it honored by grazing permittees.



D. Other conclusions (vegetation composition, cover, wildlife habitat, overall land health)

The areas planted and seeded have an open forest appearance. There is more aspen regeneration than what was expected. Lodgepole pine is reseeding on the sites. Alpine fir is the next most prominent species. Spruce is scattered and found mostly along the edge of the cleared area. Timber sale roads are stable and passable. Signing of the public lands needs to be reviewed and updated. Found the sign at the Middle Blue timber sale area on the ground.

E. What would you do differently today?

1. Know the area to be harvested, i.e., age classes, debris, aspect, soil etc.
2. Design cutting to retain the site and stand by removing primarily suppressed, codominate trees and limited dominate trees.
3. Keep harvesting areas small.
4. Plan cutting to facilitate natural reseeding. Where is the stand in regard to seed development (7 year cycle)
5. Maintain adequate cover for site stability and seed source.
6. Plant trees as a last resort, i.e. fire, blown down etc. where large areas are impacted.
7. Refrain from large annual cut commitments.
8. Remove excessive wood debris in stands. More development of the private lands for homes may provide a need for firewood.
9. Urban interface issues will need to be addressed.

F. What are the lessons learned that could be applied in this area in the future?

1. Know all that you can about the forest area before embarking on timber cutting.
2. Reforestation is a difficult and costly process which may take many years to accomplish.
3. Forest type conversion is a means to the end and not the end in itself. The lodge pole pine is serving as a nurse crop for the eventual return of the spruce forest.
4. Aspen returns to cleared areas more than what was expected. This is good.
5. The mixed stands of pine, alpine fir and aspen provide for better wildlife habitat. Blue Mesa continues to be used heavily by elk. High lined alpine fir trees reflect this.

IV. Recommendations:

1. Follow-up treatments?

- a. Refine management practices to maintain healthy forests
- b. Dense stands may need precommercial thinning.
- c. Manage stands for their longevity and not to meet a paper commitment
- d. Salvage dead and down material to reduce the heavy wood debris
- e. Forest management will need to consider other uses more than in the past, i.e. public recreation, sightseeing, wildlife values etc. Undertake public education on forest management. The public wants to know.

2. New treatments needed?

Precommercial thinning

Wildland fire fuels reduction (urban interface)



### 3. Management?

Know the area and its potential

Sign the areas to show the public where public lands are

Interpret the old cutting areas

Make BLM presence known on the ground

### 4. Monitoring (use supervision and long term monitoring) Use supervision:

Monitor all permitted forest cutting

Watch for trespass cutting

Long-term monitoring:

Understand what has taken place in the past

Be aware of changes taking place, even though it may be slow

Write a short end of the year report to the permanent files of what transpired in the area during the year. I would keep it to one page with photos.

Make sure the person following you knows of this record and continues the effort.

Every five years review the information and prepare a paper on changes that have occurred.



Legacy Project, Lander Site Visit August 26, 2002  
James (Smokey) O'Connor (RET)

## PROJECT DESCRIPTION

The project visited was the Granite Mountain Sagebrush Spraying of the Lander Field Office. The site is located approximately 12 miles NNE of the Sweetwater Crossing Junction of Highways 287 and 135. The aspect is sagebrush. The cover is low Big Sagebrush, Black Sage and Western Wheatgrass.

The project objectives were to remove brush to increase soil moisture and increase desirable grasses. Management goals were grazing oriented to increase forage for domestic livestock.

The initial project was to be a 5 year effort whereby 12,000 acres of sagebrush were to be 85% removed, one-fifth of the acreage each year.

A vegetation transect had been established, this was not located during the site visit and the number of follow-up studies is unknown.

## IMPLEMENTATION

The plan of the spraying was to be done in 100 foot wide strips leaving 400 feet between strips at the beginning of the 5 year period, and successively fill in between the strips 100 feet at a time until the entire space was treated. As this was an important sage grouse area the Wyoming Game and Fish Department were consulted. They felt the strip spraying as planned would not have too adverse effects on wildlife habitat.

In May 1961 the initial spraying was done in strips according to the plan. The 100 foot strips were up to 3 miles long. The Game and Fish were initiating a study to determine the effects of the spraying on sage grouse. In 1962 the strip spraying was abandoned and the strip area was block sprayed to complete the treatment. Adjacent area to the north was block sprayed in 1963 and another adjacent area further north in 1964. At the completion of the spraying in 1964 approximately 13,000 acres had been treated.

No changes in grazing use or seasons was done initially, and probably not during the duration of the project. The original area is adjacent to the stockwater well serving the area then and now.

Wyoming Game and Fish initiated studies and BLM set out transects marked by project markers.

From 1961 on the Sagebrush Spraying projects had to consider soil moisture at 2 foot depth as well as the sage growth stage to insure optimum kill. Inspection reports in 1962 of the 1961 work report a 95% sagebrush kill and an increase of grass production of 40% compared to the range survey of 1957-58.

The sage cover in the area is a uniformly low growth aspect with most of the shrubs being less than 18 inches tall. Some higher growth is evident along the shallow watercourses but overall it would be a low sage type.

## RESULTS

It was extremely difficult to see the original strips. In fact it was almost a nuance in shading that made them visible. An inspection report made in 1982 recommended abandoning the project because it was hard to find the spray areas and the sage had grown back in. We did not notice hardly any dead plant material whether from the spraying or natural mortality. A general photo in the files taken during the spray operation (not a monitoring photo) would seem to show that there is now more sage and grass than before.

The objectives of removing the brush to increase soil moisture and desirable grasses were probably met in the short term as evidenced by the 1962 report. But in 20 years or less the project had outlived its useful life. In the more northern block spray areas I did not notice the forbs that I remembered being in the grassy places in 1958-61. I can't say whether this is a result of the spraying or not.



The files contain an undated photocopy of a magazine article by Warren Higby who was the Game and Fish Bird Biologist involved with this project. I would assume the date is 1965 or thereabouts. He documents reduced winter counts and birds on strutting grounds declining from an average of around 50 in 1961 to 7 or 8 by the 1964 season.

During the planning phase of the project the Game and Fish opposed spraying within 1 mile of West Long Creek as it is the only permanent stream in the area and valuable nesting area. The grassy area mentioned above is one of the tributaries of West Long Creek.

We did see one small flock of sage grouse northeast of Findley Lake well.

I think the change in the way the following sprays were done is contrary to the agreed on methods. That the Game and Fish was concerned is evidenced by a memo in the files dated October 18, 1961 where the Biologist indicated they understood that the area was to be sprayed in strips until the entire area had been treated.

If I were to plan a sage spraying project today it would be to treat smaller areas, say 160-200 acres completely, defer grazing, avoid places with lots of valuable forbs, and certainly consider other needs such as wildlife habitat. The continued grazing use probably contributed to the density of the regrowth of the sage, but the temporary release of the grass species was beneficial.

The amount of regrowth in 20 years was surprising to note in the files. We certainly didn't understand the physiology of sagebrush to reseed itself given the percentage of kill reported.

The idea to change the composition on a single block of 12,000 acres was acceptable then given the limited objective of increasing soil moisture for the benefit of desirable grass (and livestock). At that time we expected very successful kills of sage from spraying and didn't consider other values.

Large blocks of any kind of mono-culture wouldn't be performed today. I sure wouldn't lay out a project in such a large scale manner today.

#### RECOMMENDATIONS

I don't think that we should repeat the treatment since it didn't appear to have a very long useful life and was probably harmful to sage grouse over the long term. Soil depth does not appear to be the principal limiting factor so management over the long term may increase the understory vegetation to limit the sage increase.

If removing sage is desired I would recommend a brush hog for the treatment. This would be done in small patches to create a mosaic effect, however the cost versus expected life versus benefits may not be worth the effort.

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Chief, Soil and Moisture, Lander District, 1958-61



Legacy Project, Worland Site Visit, August 27, 2002  
James (Smokey) O'Connor (RET)

## PROJECT DESCRIPTION

The projects visited were the Burnt Wagon Contour Furrowing and the Drainage 6 waterspreader dikes and contour furrows and are located in the 15 Mile area of the Worland Field Office. The sites are approximately 15-18 miles from Worland.

The soils in the project areas are derived from Wasatch formations and are typical erosive badland soils.

The project objectives for contour furrowing were to improve forage cover and to reduce runoff. The waterspreaders objectives included reducing erosion. Management goals were to increase carrying capacity.

I don't recall any pre-treatment baseline studies or continuing monitoring.

## IMPLEMENTATION

The waterspreaders were constructed between 1953-56 as part of an extensive construction program in the 15 Mile Creek drainage area. Most of the side drainages had some type of structures, primarily detention dams which would regulate flows into the spreader systems. Larger drainages may also have had detention dams below the spreader areas to regulate the flow into the main channel.

The waterspreader dikes were constructed by dozer or scraper and ranged in height from 7 feet at the upper part of the system to 4 feet at the end. Most dikes were 200 to 500 feet in length and from 100 to 200 feet apart depending on slope. The water flow would follow a zigzag path through the system. The borrow to construct the dikes came from both sides of the dike. Where the dike crossed the stream channel the base had a core trench excavated 2 feet below natural grade and then backfilled. The borrows were seeded to various grass species, primarily Crested WheatGrass, and some were seeded with Kochia.

The contour furrowing was done in 1956-57 using a Model B Contour Furrow machine, made by the San Dimas Equipment Development Center. This machine consisted of 2 pairs of discs to plow 8 to 12 inch deep furrows on 5 foot centers. A device to form a dam about 10 feet apart in each furrow was operated by the travel wheels. A seed box was mounted top rear and Crested Wheatgrass was used in this project. The machine was pulled by a D-6 crawler tractor. Contour lines were staked at 200-400 foot horizontal intervals to guide the tractor operator. The furrowing continued on approximately 5 foot centers to fill in between the guide furrows.

The Drainage 6 waterspreader area was fenced to control livestock use. I don't know the grazing history of the site. The Burnt Wagon and Drainage 6 furrow areas are in the Burlington Group cattle allotment but in different pastures. They are now in a rest-rotation grazing system but prior to its inception there was annual grazing.

Monitoring studies were initiated in the Burnt Wagon area but this information was not available during the site visit. The project file contains photos taken in 1957-58 which show the furrows and the crested wheatgrass plants.

## RESULTS

The contour furrow sites have been eroded to almost uniformly smooth surface, with the furrows themselves indicated primarily by the rows of the native salt sage vegetation. The crested wheatgrass in the sandier soils show more growth, while in the heavier soils very little growth was evident. The plant growth is certainly reflective of the 3 years of drought. Overall though the furrows would not contain or retard any overland water flow.

In terms of the objectives of increasing forage and reducing erosion the furrows were probably effective in the short term, and I would guess the short term to be less than ten years. If a high intensity storm were directly over the area I would imagine the useful life to end at that time given the erosive nature of the soils. In their



current condition there would be very little difference, if any, from the pre-treatment conditions. The 1956 work cost from \$14 -\$16 per acre. I don't think the cost can be justified due to the temporary benefits to be obtained when performed on these soil sites.

We visited the upper portion of the Drainage 6 waterspreaders.

The waterspreaders are eroded in height and broken through where the original channel was. Before they failed completely they did manage to hold some silt in the spreader area of the upper dikes. Some vegetation could be attributed to the dikes. We didn't visit the major structure at the lower end of this system as it was outside the scope of the project but understand it has failed also by piping along the outlet structure, even though it was installed using the best procedures for earthen dams, including maximum density compacted fill.

The dikes failed before much channel aggradation had occurred, or had the opportunity to deposit much silt. In another system in which I am familiar, the dikes were the "syrup pan" type in which both ends were turned upstream to form shallow ponding. In this system there was considerable cutting around the ends of the dikes the first season and wooden drop structures were installed. In this case maintenance was required after one year. I haven't inspected the majority of waterspreader systems in 15 Mile but over the past 8 years have visited the area several times. None of the systems I have seen is still intact but realize my recent visits have been around 50 years after construction.

During the site visit we wondered if the dikes could be repaired and new drop structures installed to correct the channel cutting. I don't think this would be practical. We used the best engineering to install all outlet pipes or drop structure but didn't adequately consider the nature of the soils we had to work with.

We didn't find any project inspection reports in the files for this specific project so don't know if the project functioned for any period of time or failed soon after completion.

When viewed as a land treatment project to improve vegetation and reduce erosion the waterspreaders could be considered as heavy construction such as highway construction. A considerable volume of earth was moved to construct the dikes. In the long term they did not fulfill the objectives.

## RECOMMENDATIONS

I would not recommend any further physical action in the contour furrow areas. Because of the soils I would think they would lose effectiveness in a very short time and seedling establishment as shown in the 1958 photos has not endured. As they are essentially eroded to the original land plane they shouldn't be disturbed further.

The waterspreader dikes are a different problem. Should they be removed and the land restored to close to the original contour? Or should they be left in place and allowed to erode with the ongoing headcutting in the original channel? I would opt for the latter, especially if monitoring showed that there wasn't any lateral widening of the headcut channels. Some of the cutting we saw was in the deposition that occurred before the dikes started to fail.

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Range Con. Soil and Moisture, Worland District, 1956-58